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THE JOURNAL

OF THE

ROYAL DUBLIN SOCIETY.

Published Quarterly.

CONTENTS:

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1857.

M. H. Gill, Printer to the Royal Dublin Society.

Royal Dublin Society.

SHOW OF FARM AND DAIRY PRODUCE,

TO BE HELD

ON TUESDAY, NOV. 17, 1857, AND FOLLOWING DAYS.

PRIZES are offered for the following description of Produce:—

Red and White Wheat, Barley, Bere, White and Black Oats; Beans, Peas, Vetches; Flax, Mangel Wurzel, and Turnip Seeds; Kohl Rabi; Onions; Potatoes, Matured and Seedlings; Mangel Wurzel of the following kinds,—Long Red, Long Yellow, Red Globe, and Yellow Globe; Sugar Beet; Field Carrots, White and Red; Parsnips; Turnips; Field Cabbage, Red and White; Flax and Hemp Fibres; Butter, Cheese, Honey; Wools and Frieze. Prizes are also offered for Collections of Farm Produce, and also for Collections exhibited by Farms in connexion with Public Institutions which cannot compete with the produce of private individuals.

Applications for space for Exhibition must be forwarded to the Assistant Secretary on or before Tuesday, November 10, and all the samples delivered (*free of expense*) at the Society, on *Monday, November* 16, *at latest.*

The Adjudication of Prizes will take place on Wednesday, November 18, and the Public will be admissible to the Exhibition on and after Friday, November 20.

Prize Lists can be obtained on application at the Royal Dublin Society; or will be sent by post, on receipt of a postage stamp.

NOTICE.

In consequence of the impossibility of providing, at present, proper *covered* accommodation for Cattle, so greatly needed at the Winter Shows, the Council have deferred holding the Show of Fat Cattle in December next. In the meantime it is confidently hoped that the exertions now being made by the Society will enable it, ere long, to have the Cattle Yard completely covered in, when these Shows will be resumed.—(*See other leaf of the Cover.*)

ADVERTISING SHEET, No. 6.

British Association,

1857.

DUBLIN MEETING.

President.

REV. HUMPHREY LLOYD, D.D., D.C.L, F.R.S.L. & E.,
FELLOW OF TRINITY COLLEGE, DUBLIN.

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The Lord Mayor.	Lord Talbot De Malahide.	Lieutenant-Col. Larcom, LL.D.
The Provost of Trin. Coll.	The Lord Chief Baron.	Richard Griffith, LL.D.
The Marquis of Kildare.	Sir W. R. Hamilton, LL.D.	

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Assistant General Secretary.

John Phillips, Esq., M.A., F.R.S., F.G.S., Reader in Geology in the University of Oxford, Magdalen Bridge, Oxford.

General Treasurer.

John Taylor, Esq., F.R.S., 6, Queen-street Place, Upper Thames-street, London.

Local Secretaries.

L. E. Foot, Esq., 14, Upper Fitzwilliam-street; Rev. Professor Jellett, F.T.C.D., 6, Trinity College; W. Neilson Hancock, LL.D., 74, Lr. Gardiner-st., Dublin.

Local Treasurer.

John H. Orpen, LL.D., 13, South Frederick-street, Dublin.

THE Twenty-seventh Meeting of the Association will commence in Dublin, on Wednesday, the 26th of August; the Meeting will last for eight days. The opening General Meeting will be held in the Rotundo. Two Evening Meetings for Lectures will be held in the Royal Dublin Society House. There will also be an Evening Meeting at the Royal Dublin Society House, and another at the Royal Irish Academy, when an opportunity will be afforded for general conversation among the Members. The Morning Sectional Meetings will be held each day in the new Lecture Rooms, Trinity College.

The business of the Association is divided into the following Sections:—

BRITISH ASSOCIATION,—continued.

A—*Mathematics and Physics.*

PRESIDENT.—Rev. Thomas R. Robinson, D.D.

SECRETARIES.—Professor Stevelly, Queen's College, Belfast; Dr. Tyndall, Royal Institution, Albermarle-street, London;
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B—*Chemistry and Mineralogy.*

INCLUDING THEIR APPLICATION TO AGRICULTURE AND THE ARTS.

PRESIDENT.—James Apjohn, M.D.

SECRETARIES.—Dr. Gladstone, 21, Tavistock-square, London; Ph. Worsley, Esq., ————————;
Professor W. K. Sullivan, Ph. D., Industrial Museum, Stephen's-green, Dublin; Edmund W. Davy, Esq., M.B., Royal Dublin Society, Dublin.

C—*Geology.*

PRESIDENT.—Lord Talbot de Malahide.

SECRETARIES.—Professor Harkness, Queen's College, Cork, and 8, Saville-row, London; ————————;
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D—*Zoology and Botany, including Physiology.*

PRESIDENT.—William Henry Harvey, M.D.

SECRETARIES.—Dr. Lankester, Ray Society, 8, Saville-row, London; C. C. Babington, Esq., St. John's College, Cambridge;
William E. Steele, M.D., Royal Dublin Society; John R. Kinahan, M.B., Sea-view Terrace, Donnybrook, Dublin.

E—*Ethnology and Geography.*

PRESIDENT.—Rev. James H. Todd, D. D., Pres. R.I.A.

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Samuel Ferguson, Esq., 20, North Great George's-street, Dublin; Richard R. Madden, F.R.C.S. England, Leitrim Lodge, Cullenswood-avenue, Rathmines.

F—*Economic Science and Statistics.*

PRESIDENT.—The Archbishop of Dublin.

SECRETARIES.—Wm. Newmarsh, Esq., Statistical Society, 12, St. James's-square, London; E. Cheshire, Esq., Conservative Club, London;
Professor Cairnes, 38, Trinity College, Dublin; Henry Dix Hutton, Esq., 1, Nelson-street, Dublin.

BRITISH ASSOCIATION,—continued.

G—*Mechanical Science.*

PRESIDENT.—The Earl of Rosse.

SECRETARIES.—James Thomson, C. E., 6, Franklin-place, Belfast; Philip Doyne, Esq., 2, Derby-street, Westminster;
Professor Downing, LL.D., 6, Trinity College, Dublin; Alexander Tate, Esq., Dublin.

Notices of communications intended to be read at the Association, accompanied by a statement whether the author will be present at the Meeting, may be addressed to the Secretaries of the Section to which the Paper relates, or to the Local Secretaries of the Meeting, or to the Assistant General Secretary.

Scale of Subscriptions to Association:—Life Members, £10; Annual Members, £1 annually, and £1 Admission Fee; Associates for Dublin Meeting, £1. Ladies, introduced by a Member, may obtain Tickets transferable to other Ladies, price £1. Members of the Sectional Committees must become Members of the Association.

The Members of the Association connected with Dublin have commenced a Subscription for defraying the usual Expenses of giving the Association a suitable reception. Subscriptions from £1 to £25 are received by the Treasurer or Secretaries. Subscribers of £5 to the Local Fund are entitled to a Lady's or Associate's Ticket, free.

WORKS ON AGRICULTURE, &c.—continued.

THE FORESTER:

A Practical Treatise on the Planting and Management of Forest Trees.

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ROYAL DUBLIN SOCIETY,

(FOUNDED A.D. **1731**, AND INCORPORATED BY ROYAL CHARTER),

FOR PROMOTING

Husbandry and other Useful Arts

IN IRELAND.

Patron:

HER MAJESTY THE QUEEN.

President:

THE LORD LIEUTENANT-GENERAL OF IRELAND.

NOTICE TO CORRESPONDENTS.

As Communications and Donations intended for the Society's AGRICULTURAL MUSEUM,—BOTANIC GARDEN,—LIBRARY,—MUSEUM OF NATURAL HISTORY, ZOOLOGY, GEOLOGY AND MINERALOGY,—GALLERY OF FINE ARTS,—and all Specimens of Machinery, Implements, and Manufactures,—are liable to be missent to other Institutions having some similarity of name;—

It is requested that all such communications or donations shall be carefully addressed to

THE ROYAL DUBLIN SOCIETY,

KILDARE-STREET,

DUBLIN.

Royal Dublin Society.

EXAMINATIONS FOR CERTIFICATES OF MERIT.

The Royal Dublin Society has resolved to hold public Examinations at stated periods, in its House, Kildare-street, Dublin, in the subjects hereafter named, with the view of affording to persons desirous of procuring Commercial, Manufacturing, or Agricultural Situations, an opportunity of obtaining authentic Testimonials of their qualifications; and proposes to confer on deserving Candidates General and Special Certificates of Merit, according to the following Regulations :—

GENERAL CERTIFICATES.

In order to obtain a General Certificate, Candidates will be required to answer in the first two and any one of the remaining General Courses.

General Courses.

1. Writing and Composition.
2. Arithmetic.
3. Mensuration.
4. Geometry.
5. Algebra and Plane Trigonometry.
6. English History.
7. Geography.

The names of Candidates who succeed in obtaining Certificates will be published in order of Merit.

The titles of the Courses in which the Candidate has answered will be inserted in his Certificate.

Prizes will be awarded to the most deserving Candidates.

SPECIAL CERTIFICATES.

Candidates who shall have obtained the Society's General Certificate may, on sufficient answering, obtain Special Certificates of Merit in subjects connected with—

COMMERCIAL PURSUITS.
MANUFACTURING PURSUITS.
AGRICULTURAL PURSUITS.
HORTICULTURAL PURSUITS.

Special Courses.

1. BOOK-KEEPING AND MERCANTILE CORRESPONDENCE.
2. MECHANICS AND HYDROSTATICS.
3. CHEMISTRY.
4. ANIMAL PHYSIOLOGY AND ZOOLOGY.
5. BOTANY.
6. GEOLOGY.
7. THEORY AND PRACTICE OF AGRICULTURE.
8. THEORY AND PRACTICE OF HORTICULTURE.

COMMERCIAL CERTIFICATE.

Candidates for this Certificate will be examined in Book-keeping, English History, and Geography.

MANUFACTURES CERTIFICATE.

Candidates for this Certificate will be examined in Mensuration, Mechanics and Hydrostatics, and Chemistry.

AGRICULTURAL CERTIFICATE.

Candidates for this Certificate will be examined in Chemistry, Animal Physiology and Zoology, Geology and Theory and Practice of Agriculture.

HORTICULTURAL CERTIFICATE.

Candidates for this Certificate will be examined in Mensuration, Botany and Theory and Practice of Horticulture.

NATURE OF THE EXAMINATIONS.

In order to guide Candidates in preparing for these Examinations the Society offers the following Synopsis. In naming certain books in connexion with each subject, it is to be particularly understood that the Royal Dublin Society does not undertake to recommend them as the best of their class, or to appoint them as text-books. Real knowledge, no matter from what source obtained, is all that shall be required, and these books are named on the present occasion merely as a guide to Candidates. In future the fullest information as to the nature of these Examinations will be afforded to the Public by the Examination Papers which the Society undertakes to publish from year to year.

Candidates are not expected to consult all the books which are named in connexion with each subject.

General Courses.

Writing and Composition.—In this course the proficiency of Candidates will be tested by examination in—

1°. Writing from dictation.
2°. Correction of errors in Spelling, Grammar, and Punctuation, of a Manuscript.
3°. Writing an ordinary business letter on a proposed subject.

In estimating the performance of Candidates, regard will be had to the following points:—Correct Spelling, Grammar, Punctuation, facility of Expression, and good Handwriting. A bold, round style of Handwriting will be preferred.

Arithmetic.—Vulgar and Decimal Fractions; Rule of Three, Single and Double; Practice, Simple Interest, Discount, and the Chain Rule.

Regard will be had not only to the correctness of the work, but also to neatness of execution.

The following Books may be consulted:—

Arithmetic, First Book, ...	Commissioners of National Education.
Galbraith and Haughton's Manual of Arithmetic, ...	Longman and Co.
Thompson's Treatise on Arithmetic, . .	Simms and M'Intire.

Mensuration.—Numerical exercises on the peripheries of figures bounded by right lines or arcs of circles, on the superficial contents both of plane figures bounded by

right lines and circles, and also of figures bounded by plane, cylindrical, conical, and spherical surfaces, and on the solid contents of figures bounded by plane, cylindrical conical, and spherical surfaces.

Candidates will be required to furnish Estimates of the different kinds of Artificers' Work from proposed data.

In this Course particular regard will be had to proficiency in Duodecimal Arithmetic.

The following Books may be consulted:—

Treatise on Mensuration, ...	Commissioners of National Education.
Bonnycastle's Mensuration, ...	Tegg and Co.
Rudimentary Treatise on Mensuration, .	Weale's Series.
Young's Treatise on Mensuration, . . .	Simms and M'Intyre.

Geometry. — Euclid, Books I., II., III. Candidates will be expected to give demonstrations, both *vivâ voce* and in writing, of any of the Propositions.

Candidates who select this Course, and are desirous of obtaining Prizes, will be required to answer, in addition, in Books IV. and VI., together with the Definitions of Book V.

Algebra and Plane Trigonometry.—In Algebra, the Elementary Rules, the Rule for finding the Greatest Common Measure, and Simple and Quadratic Equations.

In Plane Trigonometry, the Solution of Plane Triangles and the use of Logarithmic Tables.

The following Books may be consulted:—

M'Gauley's Algebra, ...	Commissioners of National Education.
Bonnycastle's Algebra, ...	Tegg and Co.
Galbraith and Haughton's Manual of Plane Trigonometry, ...	Longman and Co.
Mathematical Tables, ...	Chambers' Series.

English History.—The Examination will be conducted partly *vivâ voce*, and partly by printed questions. The questions will be such as might be answered by a person who had acquired his knowledge from any of the school histories in common use.

The following Books may be consulted:—

Ince's Outlines, ...	Gilbert.
Goldsmith's History of England, by Pinnock, ...	Whittaker and Co.
History of the British Colonies, . . .	Gleig's Series.

Geography.—The Examination will be conducted partly *vivâ voce*, and partly by printed questions. Particular regard will be had to the Geography of the United Kingdom. Candidates should be prepared to describe, orally or in writing, the position of the different Counties and Shires; the names of the County-towns, as well as of those which are of importance from the extent of their population or trade; the position of the chief Headlands, Bays, and Harbours; the courses of the chief Rivers; and the position and direction of the Mountain Ranges.

A general knowledge of Continental and Marine Geography will be required, and the proficiency of the Candidates will be tested by requiring them to lay down on a map, furnished with meridian lines and parallels of latitude, the outlines of a Continent, with the courses of the great Rivers, the position of the Mountain Chains, the Capital and chief Cities, the names of Bays, Gulfs, Straits, &c.

The following Books may be consulted:—

Anderson's School Geography, ...	Nelson.
Thompson's Geography, ...	Simms and M'Intyre.

Betts' Geographical Slates, sold by Betts, 115, Strand, London, will prove a useful aid to Students.

Special Courses.

Book-keeping.—Candidates should be prepared to answer questions, both *vivâ voce* and in writing, as to the nature and use of the different books kept in a Merchant's office. They should be able to journalize a series of transactions from a Waste-Book, and, having posted the entries to the Ledger, to balance all the Accounts, to prove them by a Trial Balance, and finally exhibit an Account of Profit and Loss, and a Balance Sheet.

Candidates will be required to draw the usual Commercial Forms, such as Receipts, Bills of Exchange, Account Sales, Accounts Current, Bills of Parcels, and to explain the meaning of the technical terms used in general business, &c.

The following Books may be consulted:—

Elements of Book-keeping, ...	Commissioners of National Education.
Elements of Book-keeping, ...	Gleig's School Series.
Rudimentary Book-keeping, ...	Weale's Series.
Anderson's Mercantile Correspondence, .	Effingham Wilson.

Mechanics and Hydrostatics.—Candidates in this branch of Science will be examined in the Principles of Statics, Dynamics, and Hydrostatics; with special reference to their practical application, and also in the theory and construction of the most common Mechanical and Hydrostatical Machines.

The following Books may be consulted with advantage:—

Tate's Examples for Practice in Mechanics,	Longman and Co.
Galbraith and Haughton's Mechanics, . .	Longman and Co.
Galbraith and Haughton's Hydrostatics, .	Longman and Co.

Chemistry.—Candidates will be examined as to the meaning and use of Chemical Symbols, in the Chemistry of the Metalloids and of the chief Metals, with reference particularly to the following Trades and Manufactures, viz., Metallurgy of Lead, Iron and Copper, Dyeing, Soap-boiling, Bleaching, Tanning, Pottery, Brick-making, Manufacture of Gas, of Sulphuric Acid, and of Soda Ash.

The following Books may be consulted:—

Wilson's Chemistry, ...	Chambers' Series.
Gregory's Chemistry, ...	Walton and Maberly.
Fownes' Chemistry, ...	Churchill.
Elementary Chemistry, by Seoffern, . .	Orr's Circle of the Seiences.

Physiology and Zoology.—The general principles of Animal Physiology and Classification of Animals will form the chief subject of Examination; and from Candidates for the Agricultural Certificate a practical knowledge of the most important facts concerning the Horse, Ox, Pig, and Sheep will be required.

The following Books may be consulted:—

School Zoology, by Patterson, ...	Simms and M'Intyre.
Agassiz and Gould's Physiology, . . .	Bohn.

Botany.—The Examination will embrace only the leading principles of Vegetable Physiology and the Classification of Plants. From Candidates seeking the Horticultural Certificate a practical knowledge of the most usual Garden Plants will be required.

The following Books may be consulted:—

Lindley's School Botany, ...	Bradbury and Evans.
Henslow's Principles of Botany, . . .	Longman and Co.
Outlines of Botany, by Balfour, . . .	A. and C. Black.

Geology.—Candidates will be examined in the general principles of the Science: their practical knowledge of Rock specimens and of the common Ores of the useful Metals will be tested: a knowledge of a few of the characteristic fossils will be required; and the Examination will also embrace a few of the most important of the applications of Geology to Agriculture, Road-making, Quarrying and Mining Operations.

The following Books may be consulted:—

Introductory Text-book to Geology, by Page, ...	Black and Son.
Advanced Text-book, ...	Black and Son.
Richardson's Geology and Palæontology,	Bohn.

Agriculture.—Candidates will be examined as to their knowledge of the structure and constituents of Farm Plants, the nature and constitution of Soils, the nature and value of Farm-yard and Artificial Manures. They will also be required to exhibit a general acquaintance with Farm Practice, such as the nature and use of Agricultural Implements and Machines, the Fencing, Draining, and Valuation of Land; the construction of Farm Buildings; the Culture and Rotation of Farm Crops; the Diseases of Cattle, and their Treatment, together with the general management of Live Stock.

The following Books may be consulted:—

Johnston's Agricultural Chemistry, . .	Blackwood and Sons.
Morton's Cyclopædia of Agriculture, . .	Blackie and Son.
Stephens' Book of the Farm, ...	Blackwood and Sons.
Rham's Dictionary of the Farm, . . .	Routledge and Co.
Agricultural Engineering, ...	Weale's Series.

Horticulture.—Candidates will be examined in the Natural History of Edible Fruits and Culinary Vegetables, and their varieties; the principles of Vegetable Physiology, especially in their application to the several Horticultural operations of Grafting, Budding, Pruning, Transplanting, Hybridizing, &c.; the construction and management of Hot-houses, Stores, &c.; the practice of Floriculture.

The following Books may be consulted:—

Lindley's Theory and Practice of Horticulture, ...	Longman and Co.
Book of the Garden, by M'Intosh, . .	Blackwood and Son.
Loudon's Encyclopædia of Gardening,	Longman and Co.
Niel's Fruit and Flower Garden, . . .	A. and C. Black.

PRIZES.

Prizes in Money will be awarded to the best answerers.

BOARD OF EXAMINERS.

The following Members of the Society have been appointed Examiners in the General Courses for the year 1857:—

LUNDY E. FOOT, ESQ., Vice-President, Chairman.

JOHN F. WALLER, LL.D., Honorary Secretary.

WILLIAM EDWARD STEELE, M.D., Assistant Secretary.

REV. JOSEPH CARSON, D.D., F.T.C.D.

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NOTICE TO CANDIDATES.

The following classes of persons will *not* be permitted to attend the Society's Examinations for Certificates of Merit:—

1°. Persons under 15 years of age.

2°. Persons who intend to return to School for the purpose of resuming their education.

3°. Persons who either are or have been Students of a College or University.

4°. Certificated Masters of the Board of National Education, or of any other public educational body.

The first Examination, for General Certificates only, will be held in the Society's House, Kildare-street, Dublin, on Tuesday, 6th of October, 1857, and following days.

Candidates will be required to give notice to the Assistant Secretary, on or before the 1st of September, 1857, of their intention to attend this Examination.

Printed forms of notice, to be filled up, can be had on application to the Assistant Secretary.

The first Examination for awarding Special Certificates will be held in the year 1858, of which due notice will be given.

THE JOURNAL

OF THE

ROYAL DUBLIN SOCIETY.

JULY, 1857.

XXVII.—*On the Paris International Cattle Show of* 1856.

By L. E. Foot, Esq., Vice-President, R. D. S.

[Read at the Evening Meeting of the Royal Dublin Society, held on April 22, 1857, for the Announcement of Prizes awarded at the Spring Cattle Show.]

His Excellency the Earl of Carlisle, Lord Lieutenant of Ireland, President of the Society, in the Chair.

The recurrence of our Annual Spring Cattle Show has appeared to the Committee of Agriculture to afford an appropriate opportunity for giving some account of the part taken by this Society in the Great French International Cattle Show of the past year; and, as one of the Secretaries, I have been requested to undertake that duty. It is no doubt in the recollection of many I have the honour to address, that the French Government included in its world-wide invitation, to a competitive display of animals, agricultural produce, and implements, to be held in Paris, the two Societies in Ireland labouring in friendly rivalry to promote agriculture as a means of national improvement: I mean our own, and "The Royal Agricultural Improvement Society."

At the judicious suggestion of M. de Burggraff, the respected and well-known Consul of France resident in this city, through whom the invitation of the Minister of Agriculture was forwarded, the two Societies agreed to give their cordial co-operation by means of a joint Committee, and to defray the necessary expenses; this Society giving the accommodation of its premises, and the services of its officers, in furtherance of the common object.

The terms of the invitation were worthy the munificence and liberality of the Imperial Government of France: free transport from the port of debarkation to Paris for all animals and produce intended for the Exhibition; the remission of port-charges on vessels freighted with live stock and articles having the same destination; sustenance and lodging for animals during the period of the Show, free of all charge; and a return ticket to the frontier, whether sea or land, for all that was unsold, or desired to be retained by the proprietors.

Inducements so tempting and generous drew forth from Great Britain and Ireland an amount of energy and successful competition best evinced by the prize lists, to which I shall hereafter refer. The joint Committee chartered the "Windsor" steamer at an expense of £300, to convey stock and produce from Dublin to Havre, the Ballast Board liberally remitting their claim to port-charges on the vessel; and the members of the Committee were deputed to proceed to Paris, in order to represent their respective Societies. It seemed proper, however, to this Society to adopt an additional measure, peculiarly its own.

The occasion was considered opportune for presenting a respectful address to the Emperor of the French, explanatory of our objects; expressive of sympathy with his exertions to improve the agriculture of France; of our desire to promote his benevolent intentions; and explaining that our operations were carried on under auspices so regal and illustrious as to justify the additional encouragement of his Imperial Majesty's patronage. I shall reserve for a later period further reference to this address, and at present inform my hearers who were the noblemen and gentlemen named on the joint Committee representing the two Societies, and who assembled in Paris to uphold the agricultural reputation of Ireland on an occasion so remarkable. They were, the Earls of Clancarty and Erne, Lords Talbot de Malahide, and Dunlo; Sir Percy Nugent, the Hon. King Harman, Major Quentin, Captain Thomas Ball, William Stewart Trench, Charles Geo. Gray, William Owen, Henry Battersby, George Roe, John Waring Maxwell, and John George Adair, Esqrs.; to this Deputation were attached Dr. Waller and myself, as Honorary Secretaries of the Royal Dublin Society; and Mr. Edw. Bullen, as Honorary Secretary of the Royal Agricultural Improvement Society of Ireland.

Scotland was very fully represented by some of its most distinguished agriculturists, headed by the Duke of Hamilton

and the Earl of Elgin, attended by Hall Maxwell, Esq., the Hon. Secretary of the Highland Society.

The English Society was represented by its President, J. Evelyn Denison, Esq., M. P. for Malton, now Speaker elect of the new House of Commons.

The other countries sending representatives, or, as they were styled in France, "Commissaires étrangers," were, Austria, Bavaria, Belgium, Denmark, Spain, Hanover, Mecklenburgh-Schwerin, Holland, the Pontifical States, Prussia, Saxony, the two Sicilies, Switzerland, and Wirtemburg.

Every attention was paid by the authorities to those noblemen and gentlemen, who, on their arrival in Paris, recorded their names as deputies from their respective countries; cards of free admission to the Exhibition at all times were forwarded to them, and invitations sent for some festivities and ceremonials of great interest.

Having alluded to these preliminaries, I may now observe that "The Prize Cattle and Agricultural Show of Paris for 1856," which opened in the splendid Palace of Industry in the Champs Elysees on the 1st of June last, will be long memorable as the most imposing display of the kind which has yet been held in Europe; this was owing to the universal and international nature of the competition which had been invited, forming so marked a contrast to the purely local and restricted character of our British and Irish Shows. A writer in one of our familiar periodicals, thus describes the scene:—

"An invitation from the Government of a great country, coupled with the prospect of prizes of money and medals in liberal profusion, brought together such a crowd of exhibiters as were never before gathered, and probably never will be assembled again. The herds and shepherds alone were sufficient to constitute a language of Babel. There were Danes and Schleswig Holsteiners, Dutch and Saxons, Swiss and Tyrolese, Austrians, Bavarians, Bohemians, Gallicians, and Hungarians; French patois, from Bretagne to Auvergne, from Flanders to the Garonne; mixed with English provincialism of every variety from Yorkshire to Devonshire; with highland Scotch and lowland Scotch; and all sorts of Irish to be heard between Galway and Dublin Bay. Moreover, two thousand animals were there, to represent the beef, milk, cheese, mutton, wool, pork, sausages, and bristles, of Continental Europe"[a].

And again—

"Added to these sights, there were the sounds of lowing and bleating in many languages, now a blast from a Tyrolese horn, then a

[a] "Household Words," September 20, 1856.

bang from the iron kettles which in Switzerland pass for bells; while, sprinkled among an ebbing and flowing crowd of visitors, such as usually fill the Boulevards on fine summer evenings, were priest-like Bretonnes with yellow oval visages, and long black tunics; Tyrolese dairy-men, with white stockings, green breeches, short jackets, enormous calves (to their legs), and steeple-crowned hats; French veal-breeders in blue blouses and necklaces of prize medals; and Hungarian shepherds in hussar jackets and white linen petticoats; to these might be added, Highlanders in kilts, and Irishmen in short frieze coats, never omitting the native sprig of shillelagh."

Independently of its universal character and variety, the Paris Cattle Show presented other distinctive features from those held in the British dominions. In Great Britain and Ireland the progress of agriculture has been the result of individual enterprise and experience, encouraged, it is true, by voluntary association; but left by the State to find its own reward in the skill and public spirit with which it is prosecuted. In France, on the contrary, agriculture is a State interest, confided to the superintendence and solicitude of a separate Government department. Through the Minister of Agriculture and Commerce, the State controls, sanctions, rewards, encourages, or prohibits all matters relating to the soil and its products. Thus we find established by Government, in great numbers, "Fermes-ecoles," farm or model schools—with a code of rules and regulations for the instruction of pupils in agriculture; also Government "Vacheries," or cow-parks; Government "Bergeries," or sheep-walks; Government "Haras," or stud-houses, for the breeding and preservation of stock. In fact, in all matters relating to the encouragement of agriculture in France, the Government makes the rules, controls the proceedings, pays the expense, organizes, and directs what in these countries is left to the option of individual will and enterprise. It may, therefore, easily be imagined, that the most celebrated of our voluntary associations, even the Highland Society of Scotland, or the Smithfield Club, must have "paled their ineffectual fires" before an Exhibition which had a palace with an area of thirty acres for a cattle-yard, the resources of a nation for its treasury, and the munificence of an Emperor in the profusion of its rewards,—no less a sum than £2300 being given in prizes among the English, Irish, and Scotch exhibiters of stock and implements, exclusive of gratuities to herds and caretakers.

Now, bearing all this in mind, it must be gratifying to learn that the agricultural character of Ireland in the eyes of the world was worthily upheld upon an occasion so trying, and I accept the duty of satisfying my hearers on this point, by a brief analysis of the entries and prizes in those descriptions of stock most highly esteemed in these countries, with which we are most familiar, and in which alone we competed.

The first section of the first class consisted of improved short-horns, bred or imported by foreigners, and the property of foreigners or Frenchmen. The prizes in this section were numerous and liberal, ranging from 1000 to 200 francs, or from £40 to £8 of our money. Of 119 entries in this section which actually exhibited, the prizes and commendations were as follows:—20 to England, 9 to Ireland, 3 to Scotland, 3 to France, and 1 to Belgium.

Twelve months ago, in this room, Ireland was pronounced by one of those intelligent English gentlemen who favour us by acting as Judges on such occasions as the present, to be the land of short-horns. I hazard the assertion that this commendation has been borne out by the Paris Exhibition. Ireland obtained more prizes than England and Scotland united, in proportion to the stock exhibited.

England and Scotland exhibited 78 animals in the short-horn class, and obtained 20 prizes, or less than one-fourth; Ireland exhibited 21 animals, and got 9 prizes, or nearly one-half.

The exhibiters of short-horns from Ireland were, Lord Monck, Lord Clancarty, Captain Thomas Ball, Sir Percy Nugent, Hon. King Harman, Mr. George Roe, and Mr. John W. Maxwell, of Finnebrogue. Of these, Lord Monck obtained 3 prizes, and one honourable mention, two of these prizes being the second in each of the respective classes of young bulls and heifers, value 900 francs, or £36 each.

Lord Clancarty obtained 3 prizes, one (the fourth) for a bull aged 13 months, and one (the third) for his bull, "Pro Bono Publico," aged 36 months; and another for his cow, "Daisy." "Pro Bono Publico" was awarded here, last year (1856), the Irish Farmer's Gazette Cup, value £155; but surrenders it this year to Mr. Barcroft's beautiful heifer, the "Maid of Kilbogget."

The celebrated bull, "Master Butterfly," the property of Mr. Towneley, of Towneley Hall, Lancashire, took the first prize in this class, of 1000 francs, or £40—I have been told, on the ground of being younger than his competitors, which, in

the opinion of the French Judges, gave his reproductive powers an advantage.

We must all hope that these anticipations may be realized, as "Master Butterfly" has a wide field before him, having gone to assist in the colonization of Australia; the newspapers have lately announced his safe arrival at Geelong. On his return from Paris, where the rumour ran that 1000 guineas had been offered and refused for him, he went to Chelmsford, where he took the first prize, and then was purchased for a Mr. Ware, of Camperdown, Australia, for the sum of 1200 guineas. His admirers who saw him in our yard two years ago, when he won the Farmer's Gazette Challenge Cup, so generously presented to the Society by the Messrs. Purdon, will be gratified to learn, that he reached his destination in excellent condition, not the worse for his long voyage.

Captain Ball exhibited 7 beautiful animals in the short-horn class (4 heifers, 2 cows, and 1 bull), and obtained 2 prizes, one for his heifer, "Sunlight," 24 months old (the fifth), 300 francs, or £12; the other for his cow, "Peahen" (the third), 500 francs, or £20. Our worthy member also sold two of his heifers for £100 each, and a third, it is said, for a much larger sum. So much for short-horns and the success of Irish competitors.

There was a fine class of "Ayrshires," comprising 97 entries, in which, as may be supposed, the Scotch were most successful, carrying off 21 prizes; one competitor, however, from Ireland was successful, Dr. Kirkpatrick of the Model Farm, Glasnevin, whose very fine bull received honourable mention. In polled or Angus cattle, out of 39 entries, Scotland took 25 prizes and commendations; Ireland, 1, Lord Talbot de Malahide, the third, and a bronze medal for a fine heifer; and France, 1. To Lord Talbot de Malahide belongs the credit of being the first to introduce this breed to the notice of the Paris public, having exhibited an Angus bull in 1855, which won for him a gold medal. In the West Highland breed the Scotch exhibiters had it all to themselves; having taken 12 prizes out of 31 entries,—the Duke of Sutherland obtaining first prize for a five-year old cow from Dunrobin. However, Mr. William Stewart Trench, of Cardtown, sustained the credit of Ireland, by exhibiting in this class one bull, three cows, and one heifer. But now we find Ireland pulling up; in Kerries there were 23 entries, and 11 prizes were awarded to Irish exhibiters; the prize-takers in this class, which seemed to be specially encouraged by the French au-

thorities, were, for bulls, Lord Talbot de Malahide, Mr. Geo. Roe, and Mr. Edward C. Irvine of Hampton, Drumcondra; for cows, Mr. O'Reilly Dease, Mr. George Roe, Mr. William Stewart Trench, Sir Percy Nugent, and Mr. William Owen. Lord Talbot de Malahide also obtained a gold medal for the best Kerry bull.

The above classes constituted those in which English, Scotch, and Irish exhibiters were alone interested; and it will be seen that, with the exception of one Ayrshire and one polled, the short-horns and Kerries sustained the reputation of Ireland—and well, I submit, it has been sustained; the general result being 20 prizes and commendations, out of 44 animals exhibited in these two classes.

It is not my intention to trouble my hearers with a minute description of all the foreign races of horned stock, which excited the curiosity of British and Irish breeders, but certainly not their cupidity. To particularize them were to enumerate the districts and cantons of most of the countries of Europe; the general inferiority of these animals, to our improved and cultivated breeds, in all the great essentials sought after, except, perhaps, as animals of draught, would render such a task uninteresting. In fact, one of the objects contemplated by the French Government in this Exhibition was to afford the opportunity of contrast, as well as inducements to native proprietors to improve existing races by judicious crosses with breeds of indisputable superiority; a process, the advantages of which are yet but partially understood on the Continent, where many races still preserve the characteristic types of their wild aboriginal origin, as the lean, ungainly Hungarian and Gallician breeds, which appear to send all their nutriment into the growth of enormous horns, ranging from 5 to 8 feet wide from tip to tip, and appearing to their unfortunate possessors an ornament exceedingly difficult to manage.

When speaking of the foreign breeds as not necessary to be particularized, I except certain French breeds, some of which, as the Normandes, were remarkable for their fine appearance, and looked like good milkers; of these there were 61 entries. Normandy excels most parts of France in the beauty and richness of its pastures. I have seen it stated that the large-boned Normande animals, the best of the French breeds, cannot be transplanted, because they require better grass than most districts afford. Hearing this, it may occur to some present to ask the question, To what purpose, then, do Frenchmen purchase our Durhams, Devons, and other first-rate stock, if they have not good grass to give them? This ob-

vious question need not be asked of an English or Irish breeder, for, with us, high farming and root cultivation, in addition to a cooler and moister climate, have put almost all counties on a par. And here we arrive at a marked distinction between our agriculture and that of France: we cultivate and improve the land with reference to the sustentation of the best stock; in France they seem desirous to improve their stock, neglectful in a great degree of the conditions on which their nourishment and growth depend; viz., abundance of nutritious food, only to be extracted from land naturally good or artificially improved. A Number of the Royal Agricultural Society's Journal, published about the time of the Cattle Show, contrasted French and English farming in some remarkable particulars. Amongst other things it states that the Englishman, by devoting a considerable area to green crops and the raising of cattle, not only maintains the fertility of his fields, but produces more wheat from a smaller surface. England, it seems, is not larger than a fourth of France; yet the writer, who is a Frenchman, avers that, taking all products into account, animal and vegetable, the produce of England per "hectare" nearly doubles that of France. The French "hectare" contains $2\frac{1}{2}$ English acres[a].

Next to the Normandes come the red Flemish or Dutch, good dairy cattle, but considered indifferent makers of beef. Then there were the white "Charolais," bred about the city of Tours for the plough, and fattened when worn out; after the Charolais came the Bretonnes, diminutive animals, like our Kerries, and indicating the probability of a descent from the same original stock. Then followed a long list of varieties, named after their native provinces, Gasconne, Garronnaise, Agennaise, &c. &c., buffalo-coloured, dark-muzzled, aboriginal-looking animals, whose progenitors, no doubt, fed the legions of Cæsar when he first invaded Gaul, and on whose carcases Clovis and Charlemagne may have banqueted,—very picturesque to look at, but, as we were informed, giving little milk and less meat to their proprietors. These animals are chiefly prized for their draught and figure in many of the pictures of Rosa Bonheur.

Such, however, were not the breeds to which our French friends attached most importance; they boldly entered the lists in our favourite stock, and 55 entries of Durhams, by French owners, evinced the estimation in which the high-bred short-horns are held in France. The animals exhibited

[a] The hectare contains 107,644 square feet; the English acre, 43,560: therefore, the hectare contains $2\frac{1}{2}$ English acres, or, correctly, 2·47 English acres.

were, generally speaking, considered well bred; and most of them had been obtained from the best English blood.

The history of the introduction of short-horns into France is rather curious, and tends to illustrate the distinctive methods of procedure adopted by the two countries in such matters. It was so lately as the year 1836 that the first English short-horns were imported into France, by order of the Government of Louis Philippe. A Report of M. Lefebre St. Marie, Inspector-General of Agriculture, to the Minister of Agriculture and Commerce, published in 1849, and now on the table, forming a volume of considerable size as may be seen, is solely devoted to a detail of the introduction of the Durham or short-horn race into France, and the experiments made thereon at the Government "Vacheries" of Alfort and Du Pin. The first importation in 1836 consisted of 1 bull and 7 cows and heifers; those Government importations were continued for nine successive years, until in 1846 they reached in the aggregate 108 bulls and 85 cows and heifers. The experiments made during the period I have mentioned had relation to the fecundity of the animals, their milking qualifications, aptitude for fattening, and utility for draught; very accurate registries and statistical tables on all these points were kept. The results led the French agricultural authorities to the conclusion expressed in this Report, viz., "that the pure Durham race, male and female, possessed early productive powers; an aptitude to fatten at every age; milking qualities good, but variable, and not improved by high breeding; with great docility of character." By this elaborate process our French neighbours discovered in this stock those very properties so long known to British breeders, without the intervention of any complex Government machinery. M. St. Marie, however, sums up with the following judicious observation, which amply justifies the French Government for the pains taken to investigate the properties of this breed :—

> "These facts authorize us to say, that the Durham race is a race essentially fit to improve other races; for this purpose it deserves to be reared with care, and extensively bred, not so much for its peculiar multiplication, as that in the end it may operate by means of crosses in different degrees, to improve those properties which are not sufficiently developed throughout most of our indigenous races."

And the races most likely to benefit are stated to be the "Normande" Bretonnes, Flamande, Charolaise, &c., just

those whose provincial rusticity of appearance struck visitors at the Exhibition as likely to be improved by alliance with the aristocratic blood of Durham[a].

Independently of the several French and foreign pure breeds to which I have hitherto been adverting, there was catalogued a separate category of what were denominated "sub-races," produced by crossings, principally with the Durhams, and intended, no doubt, to illustrate M. St. Marie's doctrine of this method of improving native races. The Emperor exhibited an Ayrshire bull and heifer from his farm at Villeneuve; also a Durham cow called "Duchess" from Prince Albert's herd: these, with some good animals reared in the different agricultural schools and establishments of the State, were not entered for competition.

I pass now to sheep. The Exhibition was rich in this class of animals; the English and Scotch owners of some fine specimens of Cotswold, South Downs, Hampshire Downs, Leicesters, and Cheviots, were very successful in obtaining prizes; nor was Ireland without a share of credit,—the Hon. King Harman having obtained a prize for a pen of hogget Leicester ewes; and Mr. William S. Trench, of Cardtown, a prize for a Cheviot ram, 15 months old. The sheep sent from Ireland, as might be expected, were few, and confined to the above-named spirited gentlemen. Of foreign breeds there were about 1500 ewes and rams, of which the pure Merinos of Saxony attracted most notice. A ram belonging to Prince Esterhazy took the first prize in this class.

I presume it was an ancestor of this nobleman who, when asked by Mr. Coke, of Holkham, how many sheep he possessed, replied, he did not know, but he knew that he had 500 shepherds. This reply has been often quoted as giving an extraordinary idea of the wealth of these Hungarian nobles; but when it is considered that their flocks are fed on bleak plains of natural grasses, and on the average yield a profit of about 5*s*. a year to the owner of the land, we need not be surprised at finding it asserted "that 1000 Norfolk South Downs represent more wealth than 10,000, and more rent than 100,000 Hungarian merinos." The truth I believe to be, that our Australian colonization has of late years tended very much to lower the value of inferior merino wool, in the Continental as well as the home market; while the increased meat consumption, caused by our growing population and ex-

[a] Here prints of animals from the Government Farm of Du Pin were shown to the meeting.

tended facilities of transport, has given a greater value to the mutton than to the wool qualifications of sheep: hence has grown up a demand for the best English and Scotch breeds, in order to make two-year old mutton take the place of that fabulous article which our butchers persist in assuring us has survived four summers. Foreigners are beginning to find out this secret, and now give large prices to British breeders to improve their long-necked and long-legged breeds, hitherto valued almost solely for their wool.

In the same Journal already quoted, I find it stated, that the weight of an English sheep is twice that of a French sheep; and that an English farm on an equal surface gives six times as much mutton as a French farm.

On pigs I do not intend to dwell; there were about 300 exhibited, of which the large Yorkshire were the most conspicuous.

I understand there was nothing superior to what we are accustomed to see at our own Shows; pigs are valued in France principally for their lard, and bred more with a view to the saddler, the brush-maker, and sausage-maker, than to the making of hams and flitches, as with us. However, there can be little doubt that, with the interchange of ideas arising out of these reunions, our French friends will be enlightened on the subject of some of our valuable applications of this animal. Sir Percy Nugent and Major Quentin sustained the credit of Ireland as exhibiters in this class; obtaining honourable mention for specimens of the Berkshire and Cumberland breeds.

I shall not trouble my hearers with any description of the 500 lots of poultry which were exhibited, very fine and interesting, but not exceeding in any particular, that I am aware of, those general characteristics with which we are here familiar.

Some information respecting the French Judges and their mode of procedure may prove interesting. It was the wish of my brother Secretary and myself to obtain a series of Reports, for the information of the Society, from such of our members and others as were Jurors or Exhibiters, and we have been favoured with some communications, which, coming from practical men, possess great value. The first I shall submit to you is from a gentleman well known as a Judge at our Shows, Mr. Charles George Gray, of Ballykisteen: he writes, in reference to the Paris Exhibition:—

"As a Judge, and not an Exhibiter, horned cattle came more especially under my notice. Of this, as of many other Shows, it may be said that there was a fine collection of animals; but the most striking feature to my mind was the manner of making the awards. Having been accustomed to act as a Judge in England, Scotland, and Ireland, where I was generally associated with one or, at most, two colleagues, and to discuss calmly and slowly the different merits and deficiencies of different animals, returning again and again to the same animal,—I was utterly confounded on finding myself one of a Jury of twenty members, running hastily along the line of animals, and being required, almost before I had seen them all once, to give a vote in favour of one or another of them. When several serious mistakes had been made in the judgment of short-horns, I with my fellow-Jurors from England and Scotland, requested an explanation of the principles on which we were to form our judgment, as it appeared to us that the French Jurors looked at the animals solely with a view to their milking qualities. This explanation was not allowed to be made, and we were hurried on in our decisions, in which we British were invariably in a minority."

Mr. Gray is of opinion, the Paris Exhibition was deficient in not having had a show of horses, of which there are some remarkable breeds in France.

Major Quentin was one of the Jury on short-horns; he has favoured the Society with some observations, in which we find a perfect identity of opinion with Mr. Gray as to the unsatisfactory composition of the Juries.

After stating that Ireland was worthily represented in short-horns, and that the condition of the animals generally was higher than the foreign Judges approved of, he proceeds to say:—

"The number of members of which the Jury was composed (18) I consider unfavourable for arriving at a good conclusion as to the merits of the animals, and the more so as the British and foreign Jurors differed as to what in fact constituted the merits of short-horns; the former judging them on the principles adopted in this country; while the majority of the latter were looking for evidences of milking qualities (*in bulls as well as cows*), which are supposed to have been discovered by a M. Guinon, and to be infallible."

He goes on to say:—

"Perhaps it might be satisfactory to exhibiters of short-horns at any future Paris Exhibition, that it should be fully understood whether that breed of cattle was to be judged on the system of M. Guinon, or on the principles universally acknowledged in the land of short-horns."

Our Vice-President, Lord Talbot de Malahide, was not appealed to in vain for a Report on the department in which he acted as a Juror; that was Section 3, embracing "Vegetable, Animal, and Mineral Productions." Time does not allow me to give this valuable document *in extenso;* but it will not be withheld from the public, whom it cannot fail to gratify and instruct[a].

After classifying the subjects of inquiry, stating the course of proceeding, and the great liberality observed in the distribution of prizes,—his Lordship proceeds:—

"I may be permitted to add, that in my opinion this liberality has been even more displayed towards foreign than French productions. Mr. Battersby (my brother Juror) is more competent than I am to give an account of the cereals exhibited: two Scotch collections obtained the gold medal, as well as the 'Royal Dublin Society;' he examined them in detail, and will inform you that the different samples of corn were accurately weighed. The roots came principally under my observation, and it must be considered a remarkable display in that respect, considering the season of the year, and other unfavourable circumstances; certainly, if the Show had been six months later, we could have contributed much finer specimens of turnips and mangel wurzel than any exhibited there."

Lord Talbot expresses regret that there were no samples of Irish wool, butter, bacon, honey, oatmeal, porter, beer, preserved meats, to be seen; and, although a couple of Limerick hams, and as many bottles of Irish whiskey, were placed on the counter of the Exhibition, it cannot be said that these most important branches of Irish industry appeared in the most favourable light. He concludes by expressing a hope, that on a future occasion we shall be more on the alert, and that, through the means of this Society (for he despairs of seeing it done otherwise), an adequate Exhibition of our great agricultural riches will gladden the eyes of the friends of Ireland when they again visit an Industrial Show in Paris.

Our Vice-President, Lord Clancarty, has also favoured us with a few of his impressions, which I feel confident will gratify my hearers: after expressing his belief that the most effective exhibitions of the kind in the United Kingdom have been the Spring Cattle Shows of this Society, and stating that it required the authority and resources at the command of the

[a] See Appendix.

Emperor of the French for such an undertaking as an exhibition of agricultural produce from all the nations of Europe,—his Lordship observes:—

"The first thing that struck me was the liberality of all the arrangements for inducing foreigners to compete; whatsoever was ordered was sure to be done, and the name of the Emperor was a guarantee for its being well done: the strictest order and regularity were maintained among the heterogeneous assemblage of peasants from all parts of Europe, in charge of the stock exhibited: and all the necessary supplies of food for the animals were impartially and liberally distributed. It is only to be regretted that the French Government should have been so ill advised as to issue and enforce an order for prolonging the Show beyond the period originally fixed, whereby great inconvenience was occasioned to exhibiters; and a foot disease, said to have arisen from too long confinement in a very hot atmosphere, broke out, to the great injury of the Stock, and the prevention of sales, that would otherwise have taken place."

After noticing the prominence given to British breeders of Stock, and analyzing the prize list, Lord Clancarty observes:

"The high appreciation of the short-horned Durham stock may be gathered from the fact that, whereas no less than 45 other breeds were specified and variously encouraged by the offer of from 4 to 29, averaging about 9 prizes to each class, no less than 55 prizes were offered for the Durham breed; 25 of which were for those bred and reared in France. Analyzing the entries for the remaining 30 prizes to be competed for by Durhams reared out of France, and comparing them with the list of the prizes awarded, it is creditable to Ireland to find that the proportion of successful competition from Ireland was the highest."

An analysis made by Lord Clancarty shows that Irish exhibiters obtained a prize for every third beast entered; those from Great Britain obtained one prize for every four beasts; those from Scotland, one for every eighth beast; and those from the Continent, one for every tenth beast. His Lordship proceeds:—

"I do not take upon myself to say whether our British stock would be materially improved by the admixture of breeds imported from the Continent; but, had not the breaking out of the foot disease prevented my making any purchases, I should myself have made the experiment of a cross between the Dutch and Durham cattle; they are both short-horned breeds, and the milking qualities of the former might, I think, be advantageously imparted to the latter, and the Dutch breed improved by the fattening qualities of the

Durham. It struck me also, the Swiss cattle would do well upon our mountain lands of the west, and would improve the kind of stock (Kerries only excepted) that is reared upon them."

Lord Clancarty saw few sheep at Paris to compare with those of England; he thinks the fine lots of sheep brought annually to the great fairs of Ballinasloe (though not generally pure-bred) are samples of the most judicious combinations of races; nowhere, in fact, has he ever seen such fine sheep as the top lots of the graziers of the west of Ireland. His Lordship states that there were exhibited at Paris, from Holstein, sheep of the most extraordinary size, fecundity, and power of rearing their offspring. Three ewes were shown, each rearing three lambs, and three more, each rearing four lambs, all apparently doing well, and the lambs of great size and promise. Judging from the geographical position of Holstein, Lord Clancarty thinks the climate of Ireland well suited for the Holstein breed, which, either pure or crossed with our present race of sheep, would be a valuable acquisition to us; his intention was to have imported some, but for the disease before alluded to. Such is an outline of the observations the Society has been favoured with.

I am tempted, before leaving this subject of sheep, to quote a beautiful passage from Hugh Miller's "Testimony of the Rocks," lately published, as not altogether inappropriate. After observing that Cuvier was unable to detect any material difference between the skeleton of the fossil horse, the fossil goat, the fossil ox, and that of our domestic breeds, he goes on to say:—

"But of one of our domestic tribes, no trace has yet been found in the rocks; like the Cod family among fishes, or the Rosaceæ among plants, it seems to have preceded man by a very brief period, as if created specially for his use: I refer to the sheep; that soft and harmless creature, that clothes civilized men everywhere in the colder latitudes with its fleece—that feeds him with its flesh—and whose skin, converted into parchment, served to convey to later times the thinking of the first full blow of the human intellect, across the dreary gulf of the Middle Ages."—*Testimony of the Rocks*, p. 105.

The implements of husbandry were numerous and varied: no less than 2107 lots were exhibited; of these, 371 belonged to the United Kingdom, the superiority of which was conspicuously demonstrated all through the prize list; thus, out of 153 prizes awarded, although British exhibiters had only 371 lots out of 2107, that is, little more than one-seventh, they gained 58 prizes, or more than one-third of the whole.

The French Government are most desirous to encourage good agricultural implements, and prizes are annually distributed with this view in the several departments; yet, notwithstanding this encouragement, implement-making in France is neither as profitable to the manufacturer, nor as serviceable to the tiller of the soil, as with us. In the first place, English-made instruments are subject to high duties on entering France, amounting almost to a prohibition, said to be £40 per cent. Secondly, the price of iron in France is about double what it is in England. The cause of this is remarkable: an article in the "Journal des Debats" of January, 1856, and which is quoted in the Reports on the Paris Universal Exhibition of 1855, presented to both Houses of Parliament in the late session, thus accounts for the high price of French iron:—

"An income was to be created for the remains of the great families returned from emigration, and re-established in possession of their forests; to raise the price of iron was to raise the price of wood. One of the first acts of the Government of the Restoration was to augment the duty on iron, then only £1 15*s.* per ton; and in 1822 it was again raised, so as to bring it to £11 per ton."

The mode in which the proprietors of forests were benefited by these high duties was in the enhanced price of charcoal; in this way the average value of French iron was made £20 per ton, and of some qualities £24 per ton, showing an excess over that of English of £10 per ton. Let us now contrast the policy of our Government in reference to this great staple of manufacturing and agricultural industry. In 1819 the duty on iron imported into Great Britain was £6 10*s.* per ton; in 1825 it was reduced to £1 10*s.*; and in 1845 it was admitted free. With these facts before us, it is not surprising to learn, that a Frenchman has to pay twice as much for a steel digging-fork as an Englishman, or that Crosskill's clod-crusher, or a grubber, most valuable instruments for French agriculture (but nearly all iron), would cost a Frenchman £60 per cent. more than an Englishman. A writer in the "Revue de deux Mondes," says:—"The French agricultural steam-engines are as good as the English;" but admits, at the same time, that the English makers sell 100 where the French sell 1; and why?—because the wise remission of duties on the material entering into the manufacture lowers the price, and extends the demand. The same observation applies to artificial manures: guano and other substances are subject by French law to a duty of 20 francs per ton; if they arrive (as they almost always do) in a

foreign ship, they come free to us. Let us hope, then, that this part of the Exhibition, in which the variety and durability of British implements were so marked, may not be without advantage to the agriculture of France, by inducing the Government to adopt some of our notions on the subject of taxation, as an element entering largely into the value of all manufactured commodities, and tending to place their enjoyment within reach of the industrial classes. But there is another aspiration to which all must respond, viz., that this grand Napoleonic idea, this gathering of the nations, so happily inaugurating the commencement of (we trust) a long European peace, may prove as beneficial in its results as it has been wise and beneficent in its conception; that France and England, so lately allies in fields of battle, may from henceforth prove as loyal and faithful allies in the peaceful fields of industry; promoting in bloodless rivalry the arts and sciences, which minister to the happiness of the human race, and to the honour and stability of kingdoms.

Having now given an imperfect review of this memorable Exhibition, principally with reference to the part taken by this Society, I feel that I should very inadequately fulfil my task did I not briefly allude to the great obligation the Society is under to its noble President, his Excellency in the Chair, for the cordial assistance rendered by him to your Deputation in the important matter of presenting our address to the Emperor of the French. Not only was his Excellency pleased to approve of that address, and to sign it in his capacity of President, but also to honour my brother Secretary and myself with a letter to Lord Cowley, her Majesty's ambassador in Paris. Our Vice-President, the Earl of Clancarty, with his usual zeal and alacrity in everything pertaining to the credit or interest of the Society, accompanied your Secretaries to the Embassy, where the reception we experienced accorded fully with the gratifying circumstances of our introduction. We have reason to believe that a previously expressed intention of the Emperor not to receive personally any addresses during the Exhibition was altered, in compliment to her Majesty's Lieutenant in Ireland, who had identified himself with those expressions of sympathy and good will towards the ruler and people of France, which we cordially desired to express.

It was soon intimated to us that the Emperor would appoint an early day for the reception of our address. The lamentable inundations which hurried his Majesty from Paris to the south of France caused a delay, which was amply com-

pensated by the brilliant reception given on his return, at the Tuileries, to all foreign noblemen and gentlemen deputed to attend the Exhibition, and who were then in Paris.

On that occasion, but after the public reception was over, the address of the Royal Dublin Society (as recorded on our Minutes) was read to the Emperor, and that gracious answer returned, which now enables us to point to our roll of members, as including amongst other illustrious and honoured names, that of his Imperial Majesty, Napoleon III.

I conclude by taking this public opportunity of expressing, for myself, my colleague, the members of the Deputation in Paris, and for the Society collectively, our united acknowledgments to his Excellency for the kind interest taken by him on an occasion so important to the prestige of the Society—the result of which has tended to uphold its position abroad, and increase its influence at home; thereby securing, we venture to hope, to future times a long course of that usefulness and public good which we have this day witnessed, and are now assembled to rejoice over.

APPENDIX.

Report *on Section 3 of the French International Exhibition of Agriculture.* By Lord Talbot de Malahide, Vice-President.

VEGETABLE, ANIMAL, AND MINERAL PRODUCTIONS.

This was divided into nine subdivisions, of which two, viz., *Wines* and *Wools*, were not intrusted to the general discretion of the Jury, but were referred to special commissioners selected from the Jury by the Government. The remaining sections were:—

1. Cereals. 2. Roots, Grasses, Vegetables, Fruits. 3. Textile and Dye Plants, Down, Silk, &c. 4. Eatable Animal Substances, Honey, Wax, Sugar, Starch. 5. Preserved Meats, Manures, &c. 6. Trees, Planting, Pisciculture. 7. Butter and Cheese.

No inquiry could give a more extended view of the great variety of produce contained in the French Empire than the matters exhibited in this section. There is a great disposition to introduce the culture of new crops and plants of a sub-tropical character, and, although it is sometimes rather overdone, it frequently appears to be successful. I may instance the *Holcus saccharatus*, or *Sorghoo*, for sugar, the poppy for opium, and a variety of leguminous plants.

My own subsection was the second, Roots, &c., and I may here mention what was the course of our proceedings. The several subsections, in the first place, examined personally the contents of the gallery which came within their scope, made notes, and then deliberated *seriatim* on the rewards to be given to the more deserving

of the exhibiters. This decision was subject to be altered or confirmed by the general meeting of all the subsections, and on these occasions it was a common occurrence for several medals to be proposed for the same body or individual. If the highest medal (gold) was proposed by one subsection, the smaller ones merged in the highest, and in some instances several bronze medals were commuted into silver, or several silver medals into one gold one. In a few instances the merit of the exhibiter has been considered so great as to entitle him to several gold medals, which have generally been commuted into one gold "*medaille d'honneur*," a gold medal of *grand module.*

Great liberality was evinced in the distribution of prizes, and it was not thought inexpedient to award medals of equal value to articles *of the same kind* when produced under peculiar circumstances, and in different districts and countries. There was also shown the utmost anxiety to give every country, as far as was consistent with justice, a share in the honorary rewards, even when their contributions were insignificant.

All the first-rate wines, such as Lafitte, Château-Margot (Bordeaux), Macon, Chambertin, Clos de Vougeot (Burgundy), Sillery (Champagne), Côte rôtie (Hermitage), obtained gold medals. The same may be said of the fine qualities of cheese and butter. The French cheeses of Neufchâtel, Rochefort; the Dutch cheeses of Gouda-Derby, Edam; the Swiss cheeses of Friborg (Gruyères), were similarly distinguished. The best samples of butter, wool, tobacco, silk, flax, belonged to the same category.

I may be permitted to add, that in my opinion this liberality has been even more displayed towards foreign than French productions.

Among the competitors were to be found a great number of *Fermes Modéles* (Model Farms), and *Comices Agricoles* (Agricultural Local Societies), which produced some very remarkable collections of cereals, roots, and vegetable produce of all kinds. The exhibition from Grignon, containing a number of boring plants, extended the whole length of one side of the Exhibition, and was most interesting. There were also some very valuable collections from the south of Europe, particularly that of the Agricultural Society of Catalonia, and of Silesian produce, brought forward by Baron Anea. Algiers, Senegal, the Isle of Bourbon, and the French West Indies, were also exceedingly well represented.

Mr. Battersby (my brother Juror) is much more competent than I am to give an account of the Cereals exhibited. Two Scotch collections obtained the gold medal, as well as the Royal Dublin Society. He examined them in detail, and will inform you that the different samples of corn were accurately weighed.

The Roots came principally under my observation, and it must be considered a remarkable display in that respect, considering the season of the year, and other unfavourable circumstances. Certainly, if the Show had been six months later, we could have contributed

much finer specimens of turnips and mangel wurzel than any exhibited there.

Among the various vegetable productions brought under our notice, I fear there are not many which could be introduced into this country with advantage, owing to the great difference of climate. A new variety of grass lately imported from Hungary, the *Moha*, is highly commended, and I can give you a small specimen of it. A new variety of potato, the *Pomme de terre Chardon*, is spoken of in the highest terms as most sound and productive, and hitherto exempt from the disease. Large prizes have been awarded to the discoverer, and also to the cultivator, M. Dugriss, of this variety. I brought one specimen of it with me, and it is now planted in England; if it succeeds with me, I shall be happy to assist in its further extension.* I here append a Report on this potato by M. Rendu, one of the most intelligent and efficient Inspectors of Agriculture in France. Another matter, of considerable importance with reference to the feeding of stock, came under my observation. You are doubtless aware that there are many oleaginous plants cultivated in France; the cake remaining after the pressing of the oil is used for the fattening of cattle, and thus there is much greater variety of this description of fodder than we have any idea of. There are *tourteaux* not only of linseed and rape, but of hemp seed, poppy seed, &c. This is well deserving the attention of agriculturists.

It is much to be regretted that the full objects of the Exhibition were not fully appreciated either here or in England. Most countries in Europe exerted themselves to show off their agricultural productions to the best advantage, and I have no doubt that they will derive from it an important commercial advantage. It was far otherwise with us. There were no samples of Irish wool, butter, bacon, honey, oatmeal, porter, beer, preserved meats; and although a couple of Limerick hams, and as many bottles of Irish whiskey, were placed on the counter of the Exhibition, it cannot be said that these most important branches of Irish industry were displayed in a favourable position. I might add to these products, starch, which is an important article of produce, and which appeared there in a variety of forms, and extracted from a great variety of plants.

It may be said, with equal justice, that Englandalso forgot herself. Her butter, her hops, her unrivalled cheeses, her beer, porter, spirits, as well as all descriptions of roots and leguminous plants, were quite kept out of sight.

I trust that next year we shall be more on the alert, and that, through the means of this Society,—for I despair of ever seeing it done otherwise,—an adequate exhibition of our great agricultural riches will gladden the eyes of the friends of Ireland when they visit the International Show of 1857.

Talbot de Malahide.

Malahide Castle, *August* 5, 1856.

* The specimen of this potato which I planted at Evercreech, Somersetshire, yielded very fairly. I have replanted this year all the produce, and I hope this year to have nearly a bushel of it.

XXVIII.—*On the Remains of Fossil Plants discovered in the Yellow Sandstone Strata, situate at the base of the Carboniferous Limestone Series of Ireland, in connexion with a Communication on that subject received from* M. ADOLPHE BRONGNIART. By RICHARD GRIFFITH, LL. D., F. G. S. London and Dublin.

[Read Friday Evening, March 27, 1857.]

THE Carboniferous Limestone series, especially in its lower members, is perhaps more fully developed in Ireland than in any other part of Europe, and hence it has long been considered to offer unusual facilities, for examining and tracing the mineral structure and composition of the several series of beds, into which it might be most conveniently subdivided for the purpose of stratigraphical, as well as of palæontological arrangement; and also for considerations of an agricultural nature.

In England, until lately, the Carboniferous, or, as it is there called, the Mountain Limestone, was represented on the geological maps as one undivided series, interposed between the Old Red Sandstone, or Devonian System, and the Lower Coal, or Millstone Grit series; but, in this country, for upwards of twenty years, I have thought it desirable to subdivide it into four series (independent of fossil remains), each being distinguished from the others by their composition, as well as by their geological position.

Commencing from the base, the subdivisions have been named by me:—

1. { Yellow Sandstone / Carboniferous Slate } one group.
2. Lower Limestone.
3. Calp Series, or Middle Limestone.
4. Upper Limestone.

The present communication has reference only to the Yellow Sandstone, the lowest member of the series, and which usually rests on the upper members of the Old Red Sandstone, or Devonian System; and as, where the general series is unbroken, the Carboniferous System rests conformably on the Devonian, we may expect to find a gradual and almost insensible passage from one into the other; hence it becomes a mat-

ter of some geological importance to discover some distinctive character, by means of which we may be able, with greater precision, to draw the line of division between the two systems.

As a preliminary, I should mention that the Yellow Sandstone series consists essentially of a series of beds of yellowish or yellowish-gray grits, usually alternating with beds of greenish or blackish and bluish-gray shales; and, as we ascend in the series, beds of limestone occur, which are usually impure and arenaceous, so much so as frequently to present, when exposed to weathering, the external character and appearance of a calcareous sandstone.

These impure limestone beds usually contain the greater number of the ordinary fossil organic remains which characterize the Carboniferous Limestone, and hence, where they occur, no doubt is entertained in regard to the system to which they belong; the shale beds also contain, frequently in abundance, *Modiola Macadami* and other fossils, which must be classed with the Carboniferous System; but when we reach the lower or doubtful beds, which consist usually of yellowish-gray sandstone or grit, sometimes coarse-grained and passing into conglomerate, but usually presenting the ordinary sandstone character, doubts have been and are still entertained by many eminent geologists, as to whether they should be classed with the subjacent Devonian rocks.

In seeking for facts to assist our judgment in this matter, we naturally look to organic remains, and here we are somewhat at fault, because we rarely discover any beyond casts of plants, which are usually so imperfect as to baffle identification, excepting so far as the genera to which they belong.

Having selected during the last and present year the least doubtful specimens contained in my own collection, and having procured drawings of others from our Dublin University Museum, collected by Professor Haughton, as well as specimens of the Kiltorcan fossils, from that of the Royal Dublin Society, collected by Dr. Carte, the Director of our Museum,—I sent the whole, accompanied by careful drawings supplied by Professor Haughton, to Paris, for the inspection and opinion of M. Adolphe Brongniart, who is, perhaps, the most competent authority in Europe to decide on the characters and analogies of fossil plants; and I shall have the pleasure of reading to the Society his most important communication, which speaks for itself, and shows the cautious

and philosophical manner in which he treats a doubtful subject; but, before doing so, I may mention that, in my Geological Map of Ireland, I have coloured the Yellow Sandstone containing these fossil remains of plants as the base of the Carboniferous System; but, from investigations recently made by myself, Mr. Jukes, Professor Haughton, and others, it appears that the plants are not confined to the Yellow Sandstone beds; but in some localities, as I understand from Mr. Jukes, are found (as at Ballyvoil Head, and in the county of Cork) to extend into the red grits, and even corn stones and shales which lie below them, and which, on account of colour, I have classed with the Old Red System, and have tinted them as such on my Geological Map; hence it may happen that, instead of curtailing the Carboniferous System, and lopping off a part of its gritty tail, it may eventually be found necessary to extend its limits within the boundary of the Old Red System, as coloured on my map.

The principal localities in Ireland in which fossil plants have been obtained from the base of the Yellow Sandstone are, commencing in the northern counties:—

At Macswyne's Bay, west of Dunkineely, county of Donegal; Fallagloon and Dromard, in the valley of Ballynascreen, county of Londonderry.

Bunatrahir Bay, Carrowcor, and Glenbehy River, east and west of Ballycastle, county of Mayo.

Monaduff, near Drumlish, on the northern declivity of the Carnclonhugh mountains, county of Longford.

At Hook Head, near Fethard, county of Wexford.

At Tallow Bridge, Ardmore, Lismore, and other localities, at the base of the Yellow Sandstone, in the county of Waterford.

At Glanmire, near Cork.

At Coomhola, and other localities near Bantry, in the county of Cork.

At Kiltorcan, Ballyhale, and along the line of railway near Thomastown, and Jerpoint, county of Kilkenny, &c. &c.

The remains of fossil plants discovered in all the above-mentioned localities, as well as numerous others, always appeared to me as belonging to the genera Stigmaria and Lepidodendron, so common throughout the Carboniferous System; but within the last few years fossil plants of a different character were discovered at Glanmire, in the county of Cork, by some quarrymen employed by Sir Thomas Deane, and subsequently by the Government geological surveyors, at

Kiltorcan, county of Kilkenny, the most remarkable of which has been named *Cyclopteris Hibernica* by my much regretted friend, the late Professor Forbes, who considered the whole to be new.

During the last summer Dr. Carte visited Kiltorcan, and made a collection of fossils, which, in addition to *Cyclopteris Hibernica*, contained other new fossils, especially one of particular interest, which, having been examined, has been named by M. Adolphe Brongniart in the communication about to be read.

I should also mention that Dr. Carte had the kindness to superintend the restoration of a large specimen of a fossil plant, discovered by me in the base of the Yellow Sandstone at Macswyne's Bay, on the coast of the county of Donegal, which now rests under the southern portico in the court-yard of the Society.

With a view of more clearly illustrating the geological position in which the fossil plants occur, I have prepared several sections illustrative of their position, and I shall now briefly describe some of them. (See Plate XIII.)

Commencing at the greenstone protrusion at Carnmore, near the shore of Macswyne's Bay, county of Donegal, and extending in a north-eastern direction by Bruckless, Dunkineely, and Inver, to Mount Charles; and thence in the same direction, crossing the Yellow Sandstone and shale districts, to the north of the town of Donegal, the plant beds terminate at the mica schist, north of Lough Eask,—the entire length of this section is about nineteen miles.

This district is essentially composed of strata belonging to the Yellow Sandstone series, the base of which, at each extremity, rests unconformably on micaceous schist, and, in addition to the sandstones, contained numerous beds of shale and limestone, which are generally arenaceous.

The calcareous shales and limestones occur chiefly at the eastern and western extremities, near to the bottom of the series, and, as they contain abundance of fossils which undoubtedly belong to the Carboniferous Limestone, no doubt can be entertained in regard to the whole of the strata which lie above them. I may mention that the principal fossils obtained consist of *Loxonema tumida*, *Euomphalus calyx*, *pentangulatus*, &c.; *Pleurorhynchus*, or *Conocardium minax*, *Avicula laminosa*, *Aviculopecten ellipticus*, *Sowerbii*, &c.; *Productus caperatus*, *concinnus*, *scabriculus*, &c.; *Orthis filiaria* and *resupinata*, *Spirifer attenuatus*, *Athyris concentrica*, *Rhyn-*

chonella pleurodon, &c.; *Actinocrinus tenuistriatus; Turbinolia fungites*, *Fenestella antiqua*, &c. &c.

We now descend to the strata which lie below these limestone and shale beds, which abound in carboniferous fossils, and we find them to consist of alternations of yellowish-gray conglomerates and yellow sandstone grits, with dark-gray shales; both the sandstones and shales, as well as the conglomerates, contain, in considerable abundance, casts of plants more or less perfect; the most important specimen which has been obtained being at present placed in our court-yard, as has already been mentioned.

My friend, Professor Haughton, who has devoted much attention to the examination of these casts of fossil plants, will let us have the advantage of his opinion. As for myself, when I visited this part of the country many years ago, I did no more than note their occurrence, and passed them over without much consideration.

In our southern districts the Yellow Sandstone series is is not nearly so well developed as in the north; its place being occupied by a great extension of the Carboniferous Slate, which immediately succeeds it, and with which it is intimately connected; in fact, had not the Yellow Sandstone series formed so important a member of the Carboniferous System in our northern counties, and the Carboniferous Slate in the southern, I should have united them in one series, under the names of Yellow Sandstone and Yellow Sandstone Shale; but the remarkable development of dark-gray schistose rocks, in the county of Cork, and their fissile structure, presenting, as they do, a system of cleavage, as perfect as that of the roofing slate of North Wales, rendered it necessary to use the term slate in preference to shale, as being more applicable to the schistose beds, occupying the same geological position in regard to the Yellow Sandstone of the south as do the shales in regard to the Yellow Sandstone of the northern counties.

The Yellow Sandstone in our southern districts usually occupies a comparatively narrow belt, interposed between the Old Red Sandstone of the hilly regions and the Carboniferous Slate and Lower Limestone troughs, which occupy the valleys of all the important rivers; its position in this respect can at once be seen by reference to the section engraved on the north-eastern margin of the last edition of my large Geological Map of Ireland.

This section, which extends from the granite of the Blackstairs mountain, in the county of Carlow, in a south-western

direction, to Cork Head, at the mouth of Cork Harbour, being a distance of about ninety-five miles, clearly exhibits the geological structure of the south-east of Ireland, and in its progress shows the relative positions of the lower Silurian strata of the counties of Kilkenny and Waterford, the Old Red Sandstone or Devonian System, in the counties of Kilkenny, Waterford, and Cork, and the Carboniferous Limestone series as it occurs, filling up the troughs of the valleys of the Blackwater and Bride Rivers, and also of the river Lee, at Cork Harbour, and, in every case, as before mentioned, we find a belt of Yellow Sandstone skirting the base of the Red Sandstone declivities, interposed between those strata and the Carboniferous Slate and Limestone which occupy the centre of every valley.

When these several valleys were first examined by me, upwards of twenty years ago, I carefully sought for the casts of plants, usually so abundant in the Yellow Sandstone and greenish shales which skirted the margin of the subjacent red shale and red grits, and I adopted them as the base of the Carboniferous System; and any young geologist, who may wish further to explore these fossil repositories, will find ample amusement in tracing them; he may do so for, say, hundreds of miles on the northern and southern margins of the valleys of the several rivers I have enumerated, and, during the investigation, no doubt, youthful eyes will discover many fossil plants not yet known to the geological world.

The most characteristic fossil plants hitherto discovered in the valleys of our southern rivers have been collected, formerly by myself, and lately by Professor Haughton, from the Yellow Sandstone at Tallow Bridge, on the river Bride, and at Ardmore, on the coast of the county of Waterford.

Fossil plants have also been collected from the margin of Yellow Sandstone which skirts the base of the mountain declivities of the Old Red Sandstone around Bantry Bay, &c., in the county of Cork, where it underlies the Carboniferous Slate of the extensive valley of Bantry, and particularly along the margin of Bantry Bay, at Coomhola, Black Ball Head, &c.; these are all interesting localities, which still require investigation with the aid of the hammer of the geologist, though, no doubt, much has already been done by the careful examination of Mr. Jukes, and his skilful assistants, as well as by Professor Haughton.

I have now only to describe more particularly the geological position of the beds in which the *Cyclopteris Hibernica*,

the *Anodon Jukesii*, and other remarkable fossils occur, which have been discovered at Kiltorcan, in the county of Kilkenny. When seen in the quarry, the greenish-gray, fine-grained, schistose beds, in which they are found, would, at first sight, appear to form a portion of the Red Sandstone series, of which the mass of the mountain is composed; but in making a section towards the north-west from Kiltorcan quarry, by the railway station, to Knocktopher, I observed that the fossiliferous beds lie nearly horizontally on the top of the red beds forming the summit of the hill, and that the red beds from beneath dip to the northward towards Ballyhale, where, in the line of the railway, the fossiliferous beds again appear at the surface, resting on red strata, and are succeeded in a northern direction by the ordinary grit beds of the Yellow Sandstone series, which, in an ascending order, continue to Knocktopher, where they are followed by the Lower Limestone of the southern plain of Kilkenny.

From Ballyhale station these remarkable plant beds extend for a considerable distance along the railway in the line of strike; and, by examination, no doubt, their outgoings may be easily traced from thence towards Thomastown and Jerpoint; and certainly it is desirable that a careful examination should be made of these strata, in the expectation of the further discovery of characteristic fossils.

I shall not enter further on the subject, but shall allow my friend, Professor Haughton,* who has devoted much attention to the fossil organic remains, and especially to the plant beds of this country, to favour us with his own views on this interesting subject; and I shall now read M. Brongniart's communication:—

Translation of a Letter from M. Adolphe Brongniart to Dr. Griffith.

"*Paris, February* 5, 1857.

"Sir,—I received in the course of the month of December the specimens of fossil plants which you have been so good as to send me, as well as the letters and drawings which accompanied them. I immediately examined them with close attention, and I beg you to accept my warm

* Mr. Haughton has thought it desirable, owing to the extensive nature of the subject, to postpone the publication of his paper, in order to include the greatest number of the lower Carboniferous plants that can be obtained, and to render the communication as complete as possible.—Ed.

thanks for the parcel and the observations, which have been full of interest for me. I proceed to state the result of this examination to you, regretting that it does not lead me to absolutely positive conclusions with respect to the geological position of the formation which contains these specimens.

"First, as to the Kiltorcan specimens, Nos. 11, 12, 6, 9, and 2, are all specimens in a much better state of preservation, and more perfect, than those which I had previously seen of the fern named *Cyclopteris Hibernica*, which, judging from the first specimen, I had considered to belong to the genus Odontopteris. The present specimens enable me much more clearly to understand how they came to be classed amongst the Cyclopterides; they do not, however, in any way belong to the natural genus to which this name has been given, there is only an analogy in the nervation; the form of the folioles, and their arrangement, are decidedly rather that of the Sphenopteris. The flabelliform nerves connect this fern with that genus, and particularly with that section or genus named Adiantites, which has undivided pinnules, not lobed, or scarcely lobed. But I do not know any species which in fact approaches closely to this one, and perhaps it forms a distinct genus. In its general appearance it approaches the *Sphenopteris lobata* of the Permian formation, but the latter has its pinnules deeply divided. Farther examinations of this plant ought to be made; it is certainly different from all with which I am acquainted in the Carboniferous strata. In the specimens Nos. 12 and 9 I remark a characteristic which is rare among the ferns, although there are some examples of it among the Neuropterides, namely, the presence of pinnules springing directly from the principal rachis, between the large lateral pinnæ; the isolated foliole of No. 2 appears to me to be one of these pinnules.

"Nos. 3, 15, and 19, are very remarkable stems, and altogether new to me. No. 3 is the most perfect and characteristic specimen: it presents two similar stems, which cross one another.

"These certainly are stems, though very much flattened, and resembling linear leaves, for they bear the scars of the insertion of very regular appendicular organs, arranged in a spiral and quincuncial form.

"The intervals between the scars are smooth, without indentation, striæ, or areoles, like those which may be seen in some species of Sigillaria, figured in my 'Histoire des Vegetaux fossiles;' but the very small scars have a form quite different:

they represent a little oval disc nearly round, the surface of which is finely granulated, and without any well defined vascular cicatrix; there is, however, an indication of a fascicle or bundle crosswise, very vaguely marked.

"The stem No. 3, which is not very thick, less than one inch in diameter, presents these scars in a very regular spiral to the number of four or five to the semi-circumference, or about 9 to the whole circumference; and since the upper series alternates with the lower series, two tiers of the spires ought to include seventeen cicatrices, an arrangement which would point to the spiral $\frac{2}{17}$ths, which is analogous to that of certain Lycopodes. But the other specimens introduce us to thicker stems.

"In the specimen No. 15, the stem does not, however, appear to include a greater number of scars: they are only a little further asunder, although each of the same dimensions, as happens upon stems more vigorous than usual, when the leaves, without having their insertions larger, have them farther asunder. No. 19 presents a stem still thicker, and with scars still more numerous, in proportion to the circumference, viz., about seven or eight to the circumference. I know no similar stem in the fossil state, and I cannot place it with certainty in any known family: it is a fossil, the farther examination of which, and the endeavour to complete its restoration, would be very interesting.

"Are these stems single or dichotomous? What are the organs inserted at the scars? Are they linear leaves, like those of the Lepidodendron; and are linear leaves contained in the same specimen portions of the same plant? Are they roots like the Stigmaria? I do not think so, but there is much uncertainty on this subject.

"Nos. 1, 5, and 8, Lepidophyllum.—I have described under this name leaves which in general belong to Lepidodendron, but which come, perhaps, also from plants of a different genus, such as the Sigillaria; they are linear leaves, narrow, uni-nerved, and generally carinated.

"Those of these specimens present these characteristics, but none of them are sufficiently perfect to enable me to determine their total length, or the form of their extremity. They much resemble those which appear on the stem 14, and which are represented on the drawing which you have sent me, but I think they are much longer, and may belong to the stems above referred to.

"In leaves of so simple a form there would naturally be

a very great analogy between the organs belonging to the different species, genera, and even families; the differences would probably be in the structure: thus, there really is often in the mere form a great analogy between the leaves of many different genera of Coniferæ, and between those of some Coniferæ and some Lycopodiaceæ.

"The dimensions of these leaves would sufficiently well suit those of the scars of the stems above referred to, and the rounded form of these scars would be no obstacle, for we see as frequently similar scars on Coniferæ which have flat, linear leaves.

"14.—This specimen, considered in connexion with the fine drawing which you have sent me on the part of Professor Haughton, gives a sufficiently exact idea of this remarkable plant.

"The general form, that of the leaves, and the arrangement of these organs on the stem, are those of the Lepidodendron; but the scars of insertion of these leaves, as well as I can observe them on portions of specimen 14, differ much from the general form of the scars of the Lepidodendron; however, considering that they correspond to young branches, still covered with their leaves, and are not true cicatrices left upon the stem after the fall of the leaves, we may, I think, consider this plant as belonging to the great genus, Lepidodendron.

"The difference between the insertions of the leaves upon young branches, the scars of recently fallen leaves upon older branches, and those of thick stems, is very great, as is plainly perceptible in the species which abound in certain coal measures.

"The leaves resemble much those of 1, 5, and 8, but they are much shorter, and a little narrower.

"I do not think that this can be a branch of *Lepidodendron minutum*, the scars of which appear shorter and more rhomboidal. I think that we ought to make a distinct species of it, which I request your permission to call *Lepidodendron Griffithi*.

"I have a specimen from Scotland from Burdie House, which approaches more nearly than any other to this plant; but the leaves have fallen, and the shape of the scars is a little different.

"The drawing of a fragment of *Lepidodendron minutum*, which the large drawing of Professor Haughton contains, is not sufficient to determine the exact form of this species, and it would be one of my principal desiderata to have good specimens of this plant with well-marked characters.

"Specimens Nos. 4, 7, 17, and 18, contain some kinds of stems without any scar, which appear to have been thick and cylindrical, and smooth on their surface. I presume that these are petioles of ferns, and from their thickness probably those of *Sphenopteris Hibernica*.

"In the specimens 1 and 10 each of them contains a fragment of broad, linear striated leaves, which appear analogous to the Nöggerathia or Pychnophyllum (*Flabellaria borassifolia* of Sternberg), but they are too imperfect to form a positive opinion with respect to them.

"No. 16 is altogether unknown to me, and its nature is very difficult to appreciate: can it possibly be a compressed rhizome of a fern?

"I would not presume to form an opinion from a single specimen which contains so few peculiar characteristics. This review of the specimens of Kiltorcan is evidently insufficient to decide the question as to the Devonian or Carboniferous character of the formation.

"Specifically these plants are different from those of the Carboniferous formation; generically they enter into the same kind of vegetation, but this is just that which appears to be the case with the small number of plants known to exist in the Devonian formation. It appears that they found about two years ago in Germany, at Saalfield, in Thuringia, a deposit of fossil Devonian plants; but Mr. Unger, who announced this fact, has not as yet, so far as I know, described or figured them, he has merely given a list of them in the Bulletin of the Academy of Sciences of Vienna; and since almost all of them are new according to him, it is impossible to compare them with your plants from Ireland: we must, therefore, be content to wait a little, until a more perfect as well as a more numerous suite of these fossils may be procured, before we can settle this interesting question: but it is much to be wished that you would collect the largest number possible of specimens from this formation, and particularly from the locality of Kiltorcan, where they are so well preserved.

"I shall be always at your disposal to study them, and to compare them with those from other localities, which I have collected in the Museum at Paris. I shall add a few words relative to the specimens from the other localities.

"1st. Tallow Bridge.—These specimens are so imperfect that it is very difficult to form any opinion with respect to them.

"I have great doubt whether the *Sigillaria dichotoma* is a

true Sigillaria, as I would rather think that all the specimens belong to different parts of *Lepidodendron;* the bark is wanting altogether, as also any well-defined cicatrices; it is only the cast of the woody axis, or of the subcortical portion, and I should rather imagine that it belonged to a *Lepidodendron*, the old stems of which, stripped of their bark, often present the same appearance. It may, perhaps, be the stem of the same plant, of which the *Lepidodendron minutum*, No. 3, may be the branch; those marked No. 4 present dimensions and a shape intermediate between both.

"2nd. Neighbourhood of Ballycastle.—1. Ill-defined fragments: the label says Ferns, but I see no traces of any. 2. Doonadoba.—Portion of dichotomous frond, greatly resembling *Fucoides antiquus* of the Transition rocks of Norway. I doubt, however, whether it is identical; the shape is a little different from it, and I perceive a trace of a central nerve, which is wanting in that fucoides. 3 and 4. Ill-defined. 5. Woody tissue, very well preserved, of a gymnospermate, coniferous Dicotyledon, or perhaps Sigillaria; the fibres under the microscope appear radiated.

3rd. Killaghtee.—1 and 2. Nothing perceptible, 3. *Stigmaria ficoides*, a very imperfect specimen, but certainly of this genus.

"I should be glad to be able to form an exact opinion as to the different kinds of stems represented in the beautiful drawing of Mr. Haughton, along with the great Lepidodendron, but even the most perfect drawings always have some particulars of the organization obscure, as there is no use in applying the lens in order to get at more details; specimens of these different stems would possess the greatest interest for me: I merely remark that Fig. 2, marked '*Sigillaria dichotoma*,' differs much from the specimens from Tallow Bridge, sent under the same name, and has more resemblance to the stems, Nos. 3, 15, and 19, described above, only that the cicatrices are represented in transverse lines, and not in oblique lines.

"The drawing of the stem with Stigmaria-like roots has afforded me great pleasure: it is a further confirmation of the facts already observed, which establish the point, that the Stigmaria are only the roots of great trees, like vegetables, generally known as Sigillaria. It is a pity that in the present case there is not a sufficient length of the stem preserved to enable me to study the form of its surface; if similar specimens should again be found, it is much to be desired that some

portion of the surface of the stem, in connexion with a fragment of the roots (selecting that which is in the best state of preservation), should be laid aside for examination.

"In closing this long letter, I beg to renew the assurance of the interest with which I shall receive the communications which you may be so good as to make to me with regard to your fossil plants, and that no efforts shall be wanting on my part to give you the best information in my power with regard to them. I regret much that in the present communication I have been forced to express my doubts rather than any positive conclusions. The subject is really so difficult, and our means of investigation so imperfect, that I feel you will excuse this.

"Have the goodness to return Mr. Haughton my best thanks for the beautiful drawing which he has sent me, and which I shall preserve most carefully.

"Will you accept, Sir, the expression of my most distinguished consideration.

"ADOLPHE BRONGNIART."

XXIX.—*The Iron and Coal of Connaught; with a brief comparison between Creevelea and English Irons.* By WILLIAM ANDERSON, C.E.

[Read on Saturday Evening, June 6, 1857.]

THE extraordinary quantity of iron and coal imported into Ireland from the sister countries would induce any one to suppose that this island has not been endowed with the minerals in question. While the indomitable energy of man is opening vast fields for commerce in the heart of remote continents; while the brilliant achievements of Dr. Livingstone are drawing upon him the eyes of the civilized world,—it is not surprising that the efforts of a Mining Association in the west of Ireland should attract but little attention, although its exertions, if crowned with success, will produce a considerable change in the prospects of the country.

Lough Allen is the first of that wonderful chain of lakes forming the Shannon. There, on the borders of the county of Leitrim, to the west of the lake, lies a district of extraordinary interest, not only in a scientific, but in a commercial point of view. Due west of the lake lie the Braulieve mountains, ris-

ing some 1100 feet above its level; through them flows the river Arigna, a mountain torrent, emptying itself into the southern extremity of the lough. These mountains at three different altitudes present an outcrop of coal in parallel and nearly horizontal strata, varying from 1 to 3 feet in thickness. From these the coal can be procured at a very small cost by the simplest mining operations; the peculiarity of position rendering pumping and winding machinery unnecessary. The Arigna detaches and carries down during floods vast quantities of ironstone, strata of which crop out abundantly throughout the district, and for many years the Arigna Works derived their supply of ore from this source alone. About seven miles to the northward are the Creevelea Iron Works, now in active operation. They were established on an extensive outcrop of ore at the foot of the Dowbally mountains, and derive their coal from the locality described above. The communication at present is imperfect, but a railway is in contemplation, by means of which the carriage of coal to the Works, and of iron to the shipping pier on the lake, may be accomplished at a very low cost.

It is difficult to conceive a locality more favourably situated for supplying Ireland with the most valuable of metals. Not many miles from Sligo on the one hand, on the banks of the Shannon on the other, it is in direct water communication with Dublin and Limerick; probably, therefore, nine or ten shillings per ton will cover the cost of carriage to all the principal towns, while the quality of iron that can be produced will insure an eager demand at the current prices of Scotch pigs.

Many years ago, when the Arigna Company was in full operation, this iron was considered as good as any Scotch or English in the market, but from mismanagement, or other causes, they abandoned their works, and it is only very lately that the Creevelea iron has come before the manufacturer. Being anxious to ascertain its quality, I resolved upon comparing it with the list of British irons experimented upon by Mr. Fairbairn, the results of whose experiments may be found in his recent work "On Cast and Wrought Iron." I selected a test-bar of the same dimensions used by him, namely, 4 feet 6 inches long, and 1 inch square, and having cast two bars of Creevelea and two of a mixture of this iron with Scotch, I broke them by hanging weights on their centres, while their ends were held up by supports 4 feet 6 inches apart. The following was the result:

Allnutt, Henry, M. B. M. S., the Compiler.
Monthly Meteorological Tables for the year 1856. 4to. *Dub.* 1857

Richard Purdy Allen, Esq., M. R. D. S.
Griffith (Richard, Mining Engineer). Report relative to the Moving Bog of Kilmaleady, in the Queen's County, made by order of the Royal Dublin Society. 8vo. *Dub.* 1821

Henry Bewley, Esq., M. R. D. S., from the Publisher.
Phillips (Charles, A. B). Vacation Thoughts on Capital Punishments. 8vo. *Lond.* 1857

C. E. Bagot, Esq., M. R. D. S.
Jews. The History of the Jews. 3 vols. 8vo. *Lond.* 1829

The Commissioners of Patents, U. S. A.
Report of the Commissioners of Patents for the year 1854. Agriculture. 8vo. *Washington*, 1855
Report of the Commissioners of Patents for the year 1854. Arts and Manufactures. Vol. 2. Illustrations. 8vo. *Washington*, 1855

S. E. le Ministre d'Agriculture, par M. Louis D'Burggraff, Consul de France.
Notes sur l'Elevage des Betail, en l'Empire D'Autriche. 8vo. *Paris*, 1856
Máreau (Theodore). Industrie Linière. Rapport a M. Dumas. Tome Premier. 8vo. *Paris*, 1857
Comptes Rendu. Relatif a l'Enseignment Professional d'Agriculture. 4to. *Paris, Janvier*, 1850
4to. *Paris, Novembre*, 1851
Payen (A.) Des Substances Alimentaires. Troisieme edition. 8vo. *Paris*, 1856
Josseau (M. J. B.) Des Institutions de Credit Foncier et Agricole dans les Divers Etats de l'Europe. 8vo. *Paris*, 1851
Herd-Book Français, Registre des Animaux, dite Race de Durham, en France. 1ier volume. 8vo. *Paris*, 1855
Concours Regionaux d'Animaus Reproducteurs, d'Instruments et des divers Produits d'Agriculture, tenus a Saint-Lo, concour National de Versailles. 8vo. *Paris*, 1851
Idem. Concours Regionaux et Concours National de Versailles. 8vo. *Paris*, 1852
Idem. Concours Regionaux et Concours Général d'Orleans en 1853. 8vo. *Paris*, 1853
Idem. Concours Regionaux et Concours Général de Paris en 1854. 8vo.
Idem. Concours Regionaux et Concours Universel de Paris en 1855. 8vo. *Paris*, 1856
Concours d'Animaux Reproducteurs Males tenu a Versailles du 8 au 18 Octobre, 1850. 8vo. *Paris*, 1851

S. E. le Ministre d'Agriculture, par M. Louis D'Burggraff, Counsel de France—*continued.*

Concours d'Animaux de Boucherie—
En 1850, a Bourdeaux. 8vo. *Paris*, 1850
En 1851, a Bourdeaux. 8vo. *Paris*, 1851
En 1852, a Bourdeaux. 8vo. *Paris*, 1852
En 1853, a Bourdeaux. 8vo. *Paris*, 1853
En 1854, a Bourdeaux. 8vo. *Paris*, 1855
En 1855, a Bourdeaux. 8vo. *Paris*, 1855

Coste (M.) Instructions Pratiques sur la Pisciculture, Deuxieme Edition. 8vo. *Paris*, 1856

Lefebvre-Ste.-Marie (M. G.) De la Race Bovine dite Race de Durham. 8vo. *Paris*, 1849

Edward Joshua Cooper, Esq., *Markree.*

Catalogue of Stars near the Ecliptic, observed at Markree, 1854, 1855, 1856. Vol. 4. 8vo. *Dub.* 1856

The Author, Le Marquis Ch. de Bryas.

Etude Practiques sur l'Art de Dessecher. Quartieme Partie, voyage en Angleterre, en Irelande, en Ecosse, et dans le Pays de Galles. 12mo. *Paris*, 1857

Exposé de Travaux de Drainage exécutés dans sa Propriété de Taillan. 24mo. *Paris*, 1855

The Directors of the Hon. East India Company.

Rig-Veda-Sanhita. The Sacred Hymns of the Brachmans; together with the Commentary of Sayanacharya. Edited by Max Muller. Vol. 3. 4to. *Lond.* 1856

The Dublin Statistical Society.

Journal of the Dublin Statistical Society:—
Ninth Session, Part 7. 8vo. *Dub.* 1856
Tenth Session, Part 8. 8vo. *Dub.* 1857

Edward Fitzgerald, Esq., M. R. D. S.

Ware (the Right Hon. Sir James, Knt.) The Antiquities and History of Ireland. Folio. *Lond.* 1705

M. (E. B.) Poems written in a Workhouse. 12mo. *Dub.* 1856

John Ribton Garstin, Esq., M. R. D. S.

Pyle (Thomas, M. A.) A Paraphrase on the Acts of the Apostles, and on the Epistles of the New Testament. 2 vols. 8vo. *Lond.* 1765

Spencer. De Legibus Hebræarum Ritualibus, Libri Tres. Auctore Joanne Spencero, S. T. D. Folio. *Cantabrigiæ*, 1685

Nicole (M.) De l'Unité de l'Eglise, ou Refutation du Nouveau Systême de M. Jurieu. 12mo. *a Lille*, 1709

Memoires D'Estat. Sons la Regence de la Reyne Marie de Medicis, et du Regne de Louys XIII. 12mo. *à Paris*, 1666
[Par le Mareschal D'Estrees, et publies par le Pere 'Le Moyne.]

Mantuani (J. Baptistæ). Opera Omnia. 4 tomi. 8vo. *Antverpiæ*, 1576

JOHN RIBTON GARSTIN, ESQ., M.R.D.S.—*continued.*

Barnard (Rev. James). The Life of the Venerable and Right Reverend Richard Challoner, D. D. 12mo. *Dub.* 1793

Doddington (George Bubb, Baron of Melcolme-Regis). Diary from March 8, 1748–9, to Feb. 6, 1761. 12mo. *Dub.* 1784

Fleming (Robert). Christology. In Six Books. Books 1, 2. 8vo. *Lond.* 1705

—— Four remaining chapters of the Third Book. 8vo. *Lond.* 1708

Formanior (R. D. Nicolaus). Sanctæ Fidei Catholicæ Confessio. 8vo. *Antverpiæ*, 1605

Green (Rev. Samuel G., A.B.) The Working Classes of Great Britain: their present condition, and the means of their Improvement. 8vo. *Lond. s. a.* [1850]

THE GEOLOGICAL SOCIETY OF DUBLIN.

Ferrari (Silvio, Barone). Calcolo Decidozzinale; Dedicato alla Nazione Inglese. 4to. *Torino*, 1854

Kendall (Hon. Amos). Morse's Patent. Dr. Charles T. Jackson's Pretensions to the Invention of the American Electro-Magnetic Telegraph. 8vo. *Washington*, 1852

Linnè (Sir Charles). A General System of Nature; Animals, Vegetables, and Minerals. Translated from Gmelin, Fabricius, Willdenow, &c. With a Life of Linnè, by William Turton, M. D. 7 vols. 8vo. *Lond.* 1806

Littell's Living Age. No. 201. 8vo. *Boston* [*Mass.*] 1848

Mouatt (Frederic J., M. D.) Trip to Reunion, the Mauritius, and Ceylon; as Sanitaria for Indian Invalids. 8vo. *Calcutta*, 1852

Musical Times, and Singing Class Circular. Vols. 4, 5; and Nos. 121 to 138, vol. 6. 8vo. *Lond. v. a.* 1850–55

Novello (J. Alfred). Catalogue of Music. *Lond. s. a.* [1852, &c.]

THE AUTHOR, SIR ROBERT J. KANE.

The Queen's University in Ireland. An Address delivered Nov. 27, 1856. 8vo. *Dub.* 1856

THE CHANCELLOR AND SENATE OF THE LONDON UNIVERSITY.

London University Calendar, 1857. 12mo. *Lond.* 1857

THE AUTHOR, BY EDWARD FALCONER LITTON, ESQ.

Massy (Richard Tuthill, M. D., L. R. C. S. I.) Analytical Ethnology: the Mixed Tribes of Great Britain and Ireland examined. 8vo. *Lond.* 1855

HER MAJESTY'S GOVERNMENT, BY SIR RODERICK J. MURCHISON.

Forbes (Professor Edward, F. R. S.) On the Tertiary Fluvio-Marine Formation of the Isle of Wight. [Memoirs of the Geological Survey of Great Britain.] 8vo. *Lond.* 1856

Hull (Edward, A. B., F. G. S.) The Geology of the Country around Cheltenham. [Memoirs of the Geological Survey of Great Britain.] 8vo. *Lond.* 1857

The North of England Institute of Mining Engineers.
Transactions of the North of England Institute of Mining Engineers. Vol. 4, 1855–6. 8vo. *Newcastle-on-Tyne*, 1856

El Observatiorio de Marina de San Fernando.
Almanaque Nautico, para el año 1858 calculado de orden de S. M. en el Observatiorio de Marina de la Ciudad de S. Fernando. 8vo. *Cadiz*, 1856

The Royal Agricultural Society of England.
Journal of the Royal Agricultural Society of England. Vol. 17. Part 2. 8vo. *Lond.* 1856

Major Archibald Rutherfoord, 4th Regiment.
La Place (the Marquis de). Mecanique Celeste. Translated by Nathaniel Bowdich, LL. D. Vol. 4. 4to. *Lond.* 1839

The Provost and Senior Fellows of Trinity College, Dublin.
Dublin University Calendar for the year 1857. 12mo. *Dub.* 1857.

The Smithsonian Institution, U. S. A.
Smithsonian Contributions to Knowledge. Vol. 8. 4to. *Washington*, 1856

The State Agricultural Society, N. A.
Transactions of the State Agricultural Society, with Reports of County Agricultural Societies for 1854. Vol. 6. 8vo. *Lansing*, 1855

The Author, L. E. Foot, Esq., V. P. R. D. S.
On the Paris International Cattle Show of 1856. 8vo. *Dub.* 1857

The Right Hon. Lord Talbot de Malahide.
Thirty-one Parliamentary Reports and Papers.

The Writer.
W. (J. F.) Memoir of Isaac Weld, Esq., M. R. I. A. (Reprinted from the Dublin University Magazine, Jan. 1857.)

The Author, M. Ferdinand de Lesseps, Minister Plenipotentiary.
Isthmus of Suez Ship Canal. Report and Plan of the International Scientific Commission. 8vo. *Lond.* 1857
The Isthmus of Suez Question. 8vo. *Lond.* 1855
Percement de l'Isthme de Suez. 8vo. *Paris*, 1856
New Facts and Figures relative to the Isthmus of Suez Ship Canal. Reply to the Edinburgh Review, by M. Barthélemy St. Hilaire. 8vo. *Lond.* 1856

Governor-General of India in Council, by Thomas Oldham, Esq.
Memoir of the Geological Survey of India. Vol. I. Part 1. 8vo. *Calcutta*, 1856

The Department of Science and Art.
Robinson (J. C., F. S. A.) Catalogue of the Soulages Collection. 8vo. *Lond. Dec.*, 1856

BOTANIC GARDENS.

The Director of the Botanic Garden at Lucca:—Seventy kinds of seeds.

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William Anderson, C. E., *Blackhall-place Iron Works:*—A very fine specimen of Crystallized Iron.

John G. Rathborne, Esq., M. R. D. S., *Dunsinea:*—A Coati Mondi (*Nasua rufa*); a Howling Monkey (*Mycetes ursinus*); a Red-billed Toucan (*Ramphastos erythrorynchus*); and a Sulphur and White-breasted Toucan (*Ramphastos vitellinus*).

Joseph Byrne, Esq., *William-street:*—A Spiny Lobster (*Palinurus vulgaris*).

Edward Smith, Esq., M. R. D. S., *Dublin Castle, or 6, Brighton-vale, Monkstown:*—Two specimens of Monkey (*Colobus ursinus*), Male and Female, from Sierra Leone.

George Gough, M.R.D.S., 18, *Longford-terrace, Monkstown:*—The Skull of a Tiger and of a Wild Boar from India.

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Mr. Francis Tredennick, 13, *Mercer-street:*—A Cuttle-fish (*Ommastrephes Eblanæ*).

George Sanders, Esq., *Sidney-avenue, Blackrock:*—A Red-breasted Merganser (*Mergus serrator*).

A. Dunlop, Esq., 29, *Wellington-road:*—A large Turtle from India.

Edward Percival Westby, Esq., *Roebuck Castle:*—The Skeleton of a Jackdaw, found in a stone wall.

Arthur Sanders, Esq., *Sidney-avenue, Blackrock:*—A young Razor-bill (*Alca torda*).

Henry Lyster, Esq., Hon. E. I. Co.'s Service, *Stillorgan:*—A small collection of Lepidoptera from Chittigong, East Indies.

John Ball Green, M.R.D.S., *Baggot-street:*—A fine specimen of a Death's-head Moth (*Acherontia atropos*).

Robert Anglin, Esq., *Wexford:*—A common Scoter (*Oidemia nigra*).

Rev. James Graves, *Kilkenny:*—A Pied Magpie.

Rev. A. M. Norman, *Kibworth*, per Dr. Kinahan:—Three specimens of *Lima hians* from Cumbra; four do. of *Astarte sulcata*, var. Scotica,from Oban.

Arthur E. Brien, Esq., Assist.-Surgeon, 3, *Seaview-terrace, Clontarf:*—Five Lepidosirens; one Lizard; three young Crocodiles; two Fish; one Snake; three Birds' Skins; one Squirrel; one Scorpion; one Bridle; and one pair of Boots. All from Cape Coast Castle, Africa.

(Signed) Alexander Carte, *Director.*

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James Smith, Esq., *Kearns' Hotel, Kildare-street:*—Specimens of New Holland Oats.

(Signed) A. Corrigan, *Curator.*

SCHOOL OF ART.

Nathaniel Callwell, Esq., M.R.D.S., 41, Fitzwilliam-place:—An ornamental Vase of Maltese stone.

*

INTELLIGENCE.

During the approaching Meeting of the British Association for the Advancement of Science, the Association will be entertained by the Royal Dublin Society at a Conversazione, to be held in the New Museum Buildings, on Thursday Evening, August 27, which will be on that occasion inaugurated. A fete will be held at the Botanic Gardens, on Saturday, August 29. Two Lectures will be delivered in the New Museum by distinguished Members of the Association, the one on the Evening of Friday, and the other on that of Monday following.

At an adjourned Meeting of the Society, held on May 14, 1857, Mr. L. E. Foot, who for 16 years had filled the office of Secretary, was unanimously elected into the office of Vice-President, in the room of Mr. Henry Kemmis, Q. C., deceased.

And at the Stated Meeting, held on June 4, Robert Harrison, M. D., Professor of Anatomy and Surgery in the University of Dublin, was elected into the office of Secretary, vacant by the election of Mr. Foot as Vice-President.

The Society is at present actively engaged in raising sufficient funds to have the Cattle Show Yard completely roofed in, so as to afford comfortable accommodation for the valuable Stock exhibited at the Annual Agricultural Shows.

The Works published by the Commissioners of the Great Seal Patent Office, and presented by the Commissioners, have been bound, and may be consulted from 11 to 5 o'clock daily, by any person applying to the Librarian.

The following Papers were read at the Evening Meetings of the Society:—

Friday, May 8, 1857.

Right Hon. Edward Lucas, in the Chair.

Mr. John Knight Boswell read a Paper—"On the Artificial Propagation of Salmon as a source of National Wealth."

A discussion followed, in which Mr. J. R. Barry and Mr. Fennell, Commissioners of Fisheries, and Mr. Stopford, took a prominent part.

Saturday, June 5, 1857.

Right Hon. the Lord Justice of Appeal, V. P., in the Chair.

Dr. Waller, Secretary, read a Paper by Mr. Edward Waller—On the Discovery of a Species of the Mollusca new to the British Islands in Belfast Lough, identified by Mr. Alder as *Buccinum Holböllii* or *Mangelia Holböllii* of Beck.

Mr. William Anderson, C. E., read a Paper—"On the Ironstone and Coal of Connaught," and exhibited specimens.

The Vice-President having left the Chair,—

A Conversazione was then held, and a number of rare and valuable objects from the Society's several Collections, including specimens of Art and Manufacture, and objects of Scientific interest contributed by private individuals, were exhibited.

JANUARY, 1857.

DATE. Day. At 3 o'Clock, P. M.	BAROMETER. Height.	THERMOMETER. Temp.	Dry.	Wet.	Max.	Min.	WIND. Direction.	CLOUD. Amount.	Form.	RAIN.	WEATHER, AND GENERAL REMARKS.
1 Thursday, . . .	29.780	50	51	49	54	48	S. W.	Many, . .	Broken. . .	. .	Dull and mild.
2 Friday, ...	29.550	45	45	43	51	39	W.	Do. . .	Do. . . .	·020	Showery and very cold.
3 Saturday, . . .	28.928	37	38	35	41	35	N. W.	Do. . .	Do. . . .	·540	Stormy, wet day.
4 Sunday, ...	29.650	33	33	31	39	33	N. W.	Do. . .	Do. . . .	·540	Stormy and showery.
5 Monday, ...	30.030	34	34	32	38	33	E.	Do. . .	Do. . . .	·290	Snow showers; air keen.
6 Tuesday, ...	30.220	36	36	35	36	33	S. E.	Do. . .	Do. . . .	. .	Dull and cloudy, light breeze.
7 Wednesday, . .	30.124	38	39	37	39	35	S. E.	Do. . .	Do. . . .	. .	Calm, mild, and cloudy.
8 Thursday, . . .	30.040	47	48	46	48	38	W.	Few, . .	Do. . . .	·030	Fine mild day.
9 Friday, ...	29.530	53	54	52	56	36	S. W.	Many, . .	Do. . . .	·130	Showery and breezy.
10 Saturday, . . .	29.200	48	49	46	54	44	S. E.	Do. . .	Do. . . .	·050	Calm, dull, and mild.
11 Sunday, ...	28.980	40	41	39	46	40	S. W.	Do. . .	Do. . . .	·190	Breezy and showery.
12 Monday, ...	29.000	43	44	42	44	31	E.	Do. . .	Do. . . .	. .	Frost A.M., thaw P.M.
13 Tuesday, ...	29.700	40	41	39	44	35	N. W.	Few, . .	Long, . . .	. .	Fair and clear, like frost.
14 Wednesday, . .	30.070	37	39	37	42	27	S. W.	Do. . .	Broken, . .	. .	Frost A.M., overcast P.M.
15 Thursday, . . .	30.000	40	41	39	43	36	W.	None, . .	. . . . .	·090	Sharp air, like frost.
16 Friday, ...	30.190	43	44	41	45	36	W.	Do. . .	. . . . .	. .	Sunshine, air cold.
17 Saturday, . . .	30.114	50	51	49	51	38	S. W.	Many, . .	Broken, . .	. .	Dull and gloomy, like rain.
18 Sunday, ...	30.228	52	54	52	55	39	S. W.	Do. . .	Do. . . .	. .	Sunshine A.M., overcast P.M.
19 Monday, ...	30.290	50	52	49	53	37	W.	Few, . .	Long, . . .	·040	Brisk breeze, fine day.
20 Tuesday, ...	29.214	38	40	38	54	35	W.	Many, . .	Broken, . .	·210	Air cold, but fine day.
21 Wednesday, . .	29.612	40	41	38	42	28	N. W.	Few, . .	Long, . . .	·040	Frost A.M., rain P.M.
22 Thursday, . . .	29.520	45	46	43	46	32	W.	Many, . .	Broken, . .	·120	Do.
23 Friday, ...	29.250	38	38	36	44	37	N. W.	Do. . .	Do. . . .	·070	Strong breeze, like rain.
24 Saturday, . . .	29.430	40	40	38	41	35	N. W.	Do. . .	Do. . . .	. .	Breezy, dull, and cold.
25 Sunday, ...	29.650	37	38	36	41	36	N. W.	Do. . .	Do. . . .	. .	Fine, but very cold.
26 Monday, ...	29.950	37	37	36	38	34	N.	Few, . .	Round, . . .	. .	Do.
27 Tuesday, ...	29.940	38	38	36	39	29	N.	None, . .	. . . . .	. .	Snow A.M., clear, like frost, P.M.
28 Wednesday, . .	29.862	38	38	36	38	28	W.	Few, . .	Broken, . .	·060	Keen frost.
29 Thursday, . . .	29.878	28	29	28	37	20	W.	Many, . .	Do. . . .	. .	Showery day.
30 Friday, ...	29.450	37	37	35	39	21	W.	None, . .	. . . . .	·150	Snow A.M., clear, like frost, P.M.
31 Saturday, . . .	29.780	34	34	33	38	30	W.	Many, . .	Broken, . .	. .	Dull and cold.
									Total Amount of Rain,	2.570	inches.

FEBRUARY, 1857.

DATE. Day, At 3 o'Clock, P. M.	BAROMETER. Height.	THERMOMETER. Temp.	Dry.	Wet.	Max.	Min.	WIND. Direction.	CLOUD. Amount.	Form.	RAIN.	WEATHER, AND GENERAL REMARKS
1 Sunday,	29.680	40	40	38	40	28	S.	Many,	Broken,	. .	Dull, gloomy day.
2 Monday,	29.650	39	39	37	41	34	S. W.	Do.	Do.	·130	Showery and cold.
3 Tuesday,	29.790	38	38	36	39	32	S. E.	Do.	Do.	. .	Frost A. M., light rain P. M.
4 Wednesday,	30.120	38	39	37	40	22	S. E.	Few,	Do.	. .	Sharp and clear, like frost.
5 Thursday,	29.780	47	47	45	48	35	S. W.	Many,	Do.	·340	Dull, breezy day.
6 Friday,	29.644	48	48	46	49	44	S. W.	Do.	Do.	·020	Dull, calm day.
7 Saturday,	29.350	42	42	40	44	42	S. E.	Do.	Do.	·020	Fair A. M., rain P. M.
8 Sunday,	29.200	41	42	40	45	32	S. E.	Do.	Do.	. .	Fine mild day.
9 Monday,	29.050	43	43	41	47	41	S.	Do.	Do.	·180	Rain A.M., fair P.M.
10 Tuesday,	29.624	46	47	45	48	37	S. W.	Do.	Do.	. .	Fine mild day.
11 Wednesday,	29.820	45	45	43	47	37	N. W.	Do.	Do.	·030	Dull, showery day.
12 Thursday,	30.270	44	45	44	47	34	W.	Do.	Do.	. .	Strong breeze, fine day.
13 Friday,	30.100	48	48	46	52	40	S. W.	Do.	Do.	. .	Fine and mild.
14 Saturday,	30.090	48	49	47	50	43	S. W.	Few,	Do.	. .	Fine clear day.
15 Sunday,	30.100	44	45	42	47	26	S. W.	Many,	Do.	. .	Frost A.M., fine P.M.
16 Monday,	29.870	45	47	44	49	36	S. E.	Do.	Do.	. .	Fine sunshiny day.
17 Tuesday,	29.800	50	51	49	52	44	S. W.	Do.	Do.	. .	Breezy, fine day.
18 Wednesday,	29.920	47	48	46	52	31	N. W.	Do.	Do.	·010	Frost A.M., dull and cloudy P.M.
19 Thursday,	30.100	45	45	43	48	38	N. E.	Do.	Do.	. .	Dull and gloomy.
20 Friday,	30.020	46	47	45	48	42	W.	Do.	Do.	. .	Fine sunshiny day.
21 Saturday,	29.900	50	50	48	54	40	S. W.	Do.	Do.	·090	Stormy and showery.
22 Sunday,	30.050	49	49	47	53	39	S. W.	Do.	Do.	. .	Do.
23 Monday,	30.180	52	53	51	54	33	S. E.	Do.	Do.	·030	Frost A.M., fine P.M.
24 Tuesday,	30.000	49	50	48	50	36	S. E.	Do.	Do.	. .	Dull, breezy day.
25 Wednesday,	30.260	48	49	47	50	39	N. W.	Do.	Do.	·050	Fine sunshiny day.
26 Thursday,	30.276	47	48	46	49	25	S. W.	Do.	Do.	. .	Frost A.M., breezy P.M.
27 Friday,	30.350	41	42	40	48	40	S. W.	Do.	Do.	. .	Fine mild day.
28 Saturday,	30.520	50	52	50	54	45	W.	Do.	Do.	. .	Fine sunshiny day.
									Total Amount of Rain,	·900	inch.

MARCH, 1857.

DATE. Day, At 4 o'Clock, P. M.	BAROMETER. Height.	Temp.	THERMOMETER. Dry.	Wet.	Max.	Min.	WIND. Direction.	CLOUD. Amount.	Form.	RAIN.	WEATHER, AND GENERAL REMARKS.
1 Sunday,	30.470	47	47	44	52	39	S. E.	Many,	Broken,	. .	Dull, gloomy day.
2 Monday,	30.400	48	49	47	49	42	S. E.	Do.	Do.	. .	Do.
3 Tuesday,	30.272	48	49	46	49	43	W.	Do.	Do.	. .	Do.
4 Wednesday,	30.050	49	50	48	50	44	W.	Do.	Do.	·010	Strong breeze, fine day.
5 Thursday,	30.048	47	49	46	50	29	S. W.	Do.	Do.	. .	Frost A. M., stormy P. M.
6 Friday,	29.950	48	49	47	50	41	S. W.	Do.	Do.	·020	Fine mild day.
7 Saturday,	29.820	48	49	46	50	43	W.	Do.	Do.	. .	Fine breezy day.
8 Sunday,	29.570	39	40	38	49	32	N. W.	Do.	Do.	·180	Snow showers, very cold.
9 Monday,	30.160	44	45	43	49	32	N. E.	Few,	Do.	. .	Fine and clear, like frost.
10 Tuesday,	29.770	41	42	40	47	20	S.	Many,	Do.	. .	Fine sunshiny day.
11 Wednesday,	29.900	40	41	39	45	39	N.	Do.	Do.	·010	Dull and cloudy.
12 Thursday,	29.750	45	47	45	47	24	S.	Do.	Do.	. .	Gloomy, like rain.
13 Friday,	29.250	44	45	43	47	44	S. W.	Do.	Do.	·200	Dull and showery.
14 Saturday,	28.850	48	50	48	50	42	S. W.	Do.	Do.	·190	Showers, and very stormy.
15 Sunday,	29.400	45	47	45	47	34	S. W.	Do.	Do.	·160	Showers, and very cold.
16 Monday,	29.720	49	51	49	51	35	S. W.	Do.	Do.	·020	Fair air, very cold.
17 Tuesday,	29.800	47	49	47	50	41	S. W.	Do.	Do.	. .	Dull, gloomy day.
18 Wednesday,	29.680	47	49	46	49	40	S. W.	Do.	Do.	·600	Very wet day.
19 Thursday,	29.830	44	45	43	47	28	S. E.	Few,	Do.	·010	Fine clear day.
20 Friday,	29.830	51	52	50	52	35	S. E.	Many,	Do.	. .	Gloomy, like rain.
21 Saturday,	29.990	45	46	44	51	40	E.	None,	. . . . .	·420	Breezy, fine day.
22 Sunday,	29.990	39	40	38	42	35	N. E.	Many,	Broken,	. .	Snow showers, very cold.
23 Monday,	29.580	40	40	38	43	34	N. E.	Do.	Do.	·040	Do.
24 Tuesday,	29.468	40	40	38	42	31	S. E.	Do.	Do.	·080	Do.
25 Wednesday,	29.430	37	38	35	40	34	N. W.	Do.	Do.	·430	Wet, cold day.
26 Thursday,	29.850	45	46	44	46	34	N.	Do.	Do.	·200	Dull, mild day.
27 Friday,	29.950	44	45	43	47	34	S. E.	Do.	Do.	. .	Dull, gloomy, and mild.
28 Saturday,	29.840	44	45	43	47	41	E.	Do.	Do.	. .	Gloomy, like rain.
29 Sunday,	29.300	47	48	45	48	43	S. E.	Do.	Do.	·210	Wet, dull day.
30 Monday,	29.180	49	50	48	52	43	N. E.	Do.	Do.	·010	Fine mild day.
31 Tuesday,	29.298	49	50	47	50	44	N. W.	Do.	Do.	·010	Do.
									Total Amount of Rain,	2·800	inch.

APRIL, 1857.

DATE. Day, At 4 o'Clock, P. M.	BAROMETER. Height.	THERMOMETER. Temp.	Dry.	Wet.	Max.	Min.	WIND. Direction.	CLOUD. Amount.	Form.	RAIN.	WEATHER, AND GENERAL REMARKS.
1 Wednesday, . . .	29·296	46	47	45	49	32	N. E.	Many, . .	Broken, . .	. .	Changeable, like rain.
2 Thursday, ...	29·150	47	48	46	50	38	N. E.	Do. . .	Do. . . .	·480	Wet, dull day.
3 Friday, ...	29·550	48	50	48	50	35	N. W.	Do. . .	Do. . . .	·020	Dull, mild day.
4 Saturday, ...	29·400	45	46	48	47	41	N. W.	Do. . .	Do. . . .	·080	Gloomy, wet day.
5 Sunday, ...	29·540	47	48	46	48	42	N. E.	Do. . .	Do. . . .	·010	Light breeze, drizzling rain.
6 Monday, ...	29·670	47	48	46	48	44	N. E.	Do. . .	Do. . . .	·010	Calm, mild day.
7 Tuesday, ...	29·810	54	56	54	56	42	S. W.	Do. . .	Do. . . .	·200	Heavy showers during day.
8 Wednesday, . . .	29·550	53	55	53	59	45	S. W.	Few, . .	Do. . . .	·040	Sunshine and showers.
9 Thursday, ...	29·400	52	53	51	53	45	S. E.	Many, . .	Do. . . .	·030	Gloomy and showery.
10 Friday, ...	29·400	51	53	51	53	43	N.	Do. . .	Do. . . .	·100	Wet A. M., fair P. M.
11 Saturday, ...	29·450	47	48	46	48	33	S. W.	Do. . .	Do. . . .	·050	Heavy rain P. M.
12 Sunday, ...	29·000	40	42	40	43	33	W.	Do. . .	Do. . . .	·160	Showery day.
13 Monday, ...	29·240	44	46	44	46	33	N. W.	Do. . .	Do. . . .	·040	Fine, air very cold.
14 Tuesday, ...	29·420	45	47	45	47	33	N. E.	Do. . .	Do. . . .	. .	Do.
15 Wednesday, . . .	29·460	45	46	44	48	34	S. E.	Do. . .	Do. . . .	·180	Heavy hail showers.
16 Thursday, ...	29·664	47	49	47	50	38	S. E.	Few, . .	Do. . . .	. .	Fine sunshiny day.
17 Friday, ...	29·528	52	52	50	54	44	S. W.	Many, . .	Do. . . .	·100	Showery day.
18 Saturday, ...	29·632	57	60	58	60	44	S. E.	Few, . .	Do. . . .	·050	Fine sunshiny day.
19 Sunday, ...	29·900	57	58	56	69	40	S. W.	Do. . .	Do. . . .	· ·	Sunshine, rather stormy.
20 Monday, ...	30·338	58	60	58	62	41	S. W.	Many, . .	Do. . . .	·020	Hail showers frequent.
21 Tuesday, ...	30·320	54	56	54	57	40	N. W.	Do. . .	Do. . . .	·	Fine sunshiny day.
22 Wednesday, . . .	30·020	55	57	55	58	48	N. W.	Do. . .	Do. . . .	·380	Wet, showery day.
23 Thursday, ...	29·950	55	57	55	57	43	S. E.	Do. . .	Do. . . .	·580	Wet A. M., fair P. M.
24 Friday, ...	29·650	43	45	43	45	42	S. E.	Do. . .	Do. . . .	·420	Very wet day.
25 Saturday, ...	29·490	43	44	42	44	40	S. E.	Do. . .	Do. . . .	·120	Showery day.
26 Sunday, ...	29·950	44	46	44	47	39	N. E.	Do. . .	Do. . . .	·020	Fine mild day.
27 Monday, ...	30·138	47	49	47	50	28	S. E.	Few, . .	Do. . . .	· ·	Do.
28 Tuesday, ...	29·020	45	47	44	48	40	S. E.	Many, . .	Do. . . .	·100	Heavy rain P. M.
29 Wednesday, . . .	30·100	48	49	47	49	42	E.	None, . .	. . . . .	·280	Very fine day.
30 Thursday, ...	30·100	52	54	51	55	29	N.	Many, . .	Broken, . .	·080	Fair A. M., wet P. M.
									Total Amount of Rain,	3·550	inch.

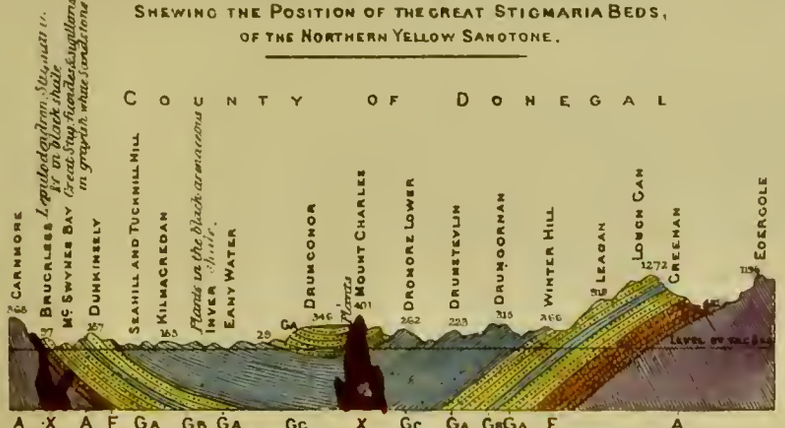
MAY, 1857.

DATE. Day, At 4 o'Clock, P.M.	BAROMETER. Height.	Temp.	THERMOMETER. Dry.	Wet.	Max.	Min.	WIND. Direction.	CLOUD. Amount.	Form.	RAIN.	WEATHER, AND GENERAL REMARKS.
1 Friday,	30.150	50	52	50	54	41	N. E.	Many,	Broken,	·020	Fair A.M., rain P.M.
2 Saturday,	30.200	52	53	52	55	42	S. E.	Do.	Do.	..	Fine sunshiny day.
3 Sunday,	30.200	53	55	53	55	40	N. E.	Do.	Do.	..	Do.
4 Monday,	30.240	50	52	50	52	43	N. E.	Few,	Do.	..	Air cold, but fine day.
5 Tuesday,	30.250	50	53	52	53	41	N. E.	Many,	Do.	..	Fine sunshiny day.
6 Wednesday,	30.260	55	57	55	57	32	E.	Do.	Do.	..	Do.
7 Thursday,	30.150	55	57	54	57	38	N. E.	Many,	Do.	..	Breezy, fine day.
8 Friday,	29.860	53	56	54	58	35	N. E.	Few,	.....	..	Do.
9 Saturday,	29.800	53	55	53	56	39	E.	Do.	Do.	..	Fine sunshiny day.
10 Sunday,	29.700	55	57	55	58	40	N. E.	Do.	Do.	..	Breezy, fine day.
11 Monday,	29.690	56	58	56	59	46	S. E.	Do.	.....	..	Fine sunshiny day.
12 Tuesday,	29.700	57	59	57	60	51	E.	None,	Broken,	..	Strong breeze, fine.
13 Wednesday,	29.850	60	62	60	65	52	S. E.	Many,	Do.	..	Gloomy, like rain.
14 Thursday,	29.870	59	60	58	62	52	S. E.	Do.	Do.	·140	Fine mild day.
15 Friday,	30.190	60	63	60	64	46	S. E.	Few,	Do.	..	Do.
16 Saturday,	30.100	53	55	53	55	48	S. E.	Many,	Do.	..	Sultry, warm day.
17 Sunday,	30.030	54	57	55	57	49	S. W.	Do.	Do.	..	Do.
18 Monday,	29.820	63	64	62	66	52	W.	Few,	Do.	..	Strong breeze, fine day.
19 Tuesday,	29.750	62	66	64	66	51	S. W.	Many,	Do.	..	Breezy, fine day.
20 Wednesday,	29.578	63	63	60	65	52	W.	Do.	Do.	·400	Very wet day.
21 Thursday,	29.500	55	56	54	64	45	S. W.	Do.	Do.	·080	Calm and mild, heavy showers.
22 Friday,	29.750	63	64	62	65	45	S. W.	Do.	Do.	·080	Fine sunshiny day.
23 Saturday,	29.748	60	62	60	64	37	S. W.	Do.	Do.	..	Cloudy, mild day.
24 Sunday,	29.440	61	62	60	63	44	S. W.	Do.	Do.	..	Fine mild day.
25 Monday,	29.350	60	63	62	65	45	N. E.	Do.	Do.	..	Do.
26 Tuesday,	29.448	57	58	56	64	50	S. E.	Do.	Do.	·430	Heavy showers during day.
27 Wednesday,	29.640	56	56	54	63	52	S. E.	Many,	Do.	·070	Strong breeze, light showers.
28 Thursday,	29.860	60	61	59	64	51	N. E.	Do.	Do.	..	Fine sunshiny day.
29 Friday,	30.300	62	63	61	64	45	S. E.	Few,	Do.	..	Do.
30 Saturday,	30.300	57	59	57	67	40	E.	Do.	Do.	..	Warm, sultry day.
31 Sunday,	29.970	60	61	58	65	49	S. E.	Many,	Do.	·070	Showery day.
									Total Amount of Rain,	1·290 inch.	

JUNE, 1857.

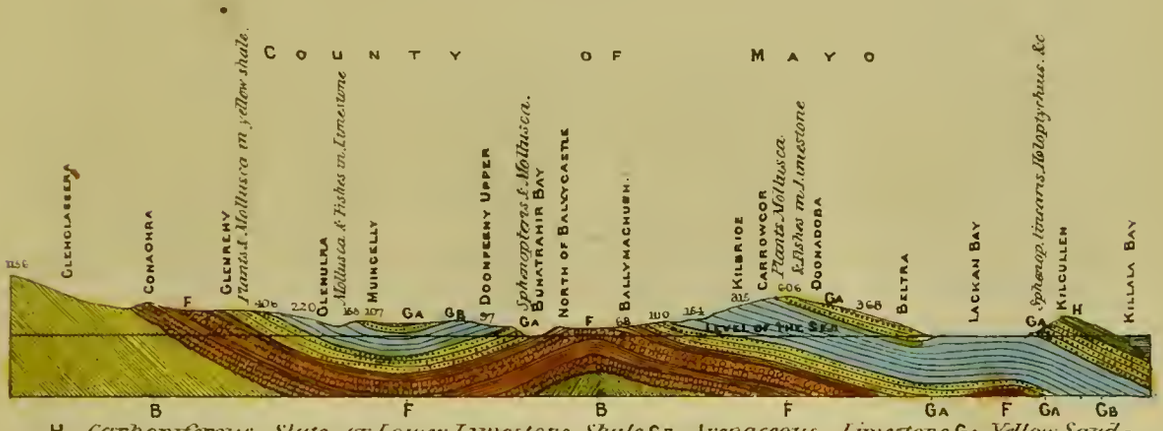
DATE. Day, At 4 o'Clock, P. M.	BAROMETER. Height.	BAROMETER. Temp.	THERMOMETER. Dry.	THERMOMETER. Wet.	THERMOMETER. Max.	THERMOMETER. Min.	WIND. Direction.	CLOUD. Amount.	CLOUD. Form.	RAIN.	WEATHER, AND GENERAL REMARKS.
1 Monday,	29.890	57	58	56	64	52	S. E.	Many,	Broken.	·260	Wet A.M., fair P.M.
2 Tuesday,	29.740	57	57	55	58	50	S. E.	Do.	Do.	. .	Light showers, cloudy day.
3 Wednesday,	29.830	66	67	65	68	50	S.	Do.	Do.	·280	Fair A.M., showery P.M.
4 Thursday,	29.830	60	64	62	66	52	S. E.	Do.	Do.	. .	Fine mild day.
5 Friday,	29.890	64	65	62	65	55	S. W.	Do.	Do.	. .	Breezy, fine day.
6 Saturday,	30.040	64	66	64	67	48	S. E.	Do.	Do.	. .	Do.
7 Sunday,	29.580	62	64	62	64	48	E.	Do.	Do.	·300	Very wet day.
8 Monday,	29.550	60	61	59	63	52	S. W.	Do.	Do.	1·010	Do.
9 Tuesday,	29.500	56	58	56	58	50	W.	Do.	Do.	·090	Showery, fine day.
10 Wednesday,	29.600	59	60	58	62	45	W.	Do.	Do.	·140	Heavy showers during day.
11 Thursday,	29.990	57	59	57	59	46	N. W.	Do.	Do.	. .	Fine mild day.
12 Friday,	30.190	57	58	55	59	45	S. E.	Do.	Do.	. .	Fine sunshiny day.
13 Saturday,	30.030	57	58	55	59	40	S.	Do.	Do.	. .	Sultry, dull day.
14 Sunday,	29.920	63	65	64	65	48	S. E.	Few,	Do.	. .	Fine sunshiny day.
15 Monday,	29.950	60	61	59	63	47	E.	Do.	Do.	. .	Strong breeze, fine day.
16 Tuesday,	30.150	63	66	64	66	49	N. E.	None,	. . . . .	. .	Do.
17 Wednesday,	30.230	70	71	68	72	45	N. E.	Do.	. . . . .	. .	Clear sunshiny day.
18 Thursday,	30.250	70	72	70	73	47	E.	Do.	. . . . .	. .	Do.
19 Friday,	30.172	64	66	64	66	53	E.	Few,	Broken,	. .	Strong breeze, fine day.
20 Saturday,	29.974	69	71	69	71	56	N. E.	None,	. . . . .	·430	Heavy A.M., fair P.M.
21 Sunday,	30.000	68	70	68	70	50	S. E.	Few,	Long,	·200	Fine warm day.
22 Monday,	30.100	67	68	67	70	52	S. E.	Do.	Do.	. .	Do.
23 Tuesday,	30.150	69	71	68	72	56	S. E.	Many,	Broken,	. .	Sultry, warm day.
24 Wednesday,	30.278	68	70	68	71	55	N. E.	Few,	Do.	. .	Bright sunshine, calm.
25 Thursday,	30.350	73	75	74	77	56	S. E.	None,	. . . . .	. .	Very warm sunshine.
26 Friday,	30.000	75	77	75	78	55	S. E.	Do.	. . . . .	. .	Do.
27 Saturday,	29.850	74	76	74	77	54	S. E.	Few,	Broken,	. .	Do.
28 Sunday,	29.700	73	75	73	75	52	S. E.	Many,	Do.	. .	Dull, sultry day.
29 Monday,	29.480	64	65	63	68	56	S. E.	Do.	Do.	·030	Showery, warm day.
30 Tuesday,	29.620	57	58	56	63	58	N. E.	Do.	Do.	·120	Dull and showery.

Section through the Lower Carboniferous District on the North Shore of Donegal Bay, Shewing the Position of the great Stigmaria Beds, of the Northern Yellow Sandstone.



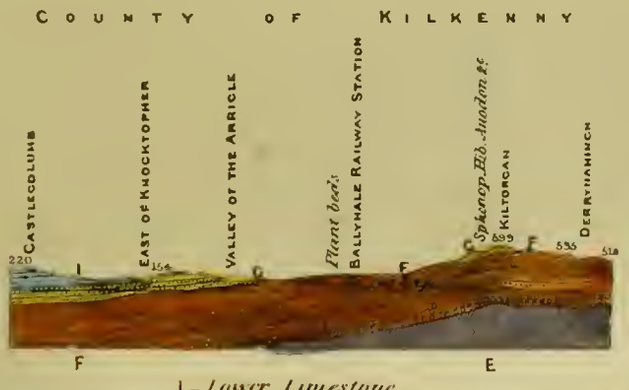
Gc — Arenaceous Shale. Cb — Arenaceous Limestone. Ga — Yellow Sandstone and shale. F — Old Red Conglomerate. A — Mica Slate. X — Greenstone dikes.

Section through the Yellow Sandstone Series of the North Coast of the County of Mayo, Shewing the position of the Arenaceous Limestone Beds, containing Plants Fishes and Mosculla



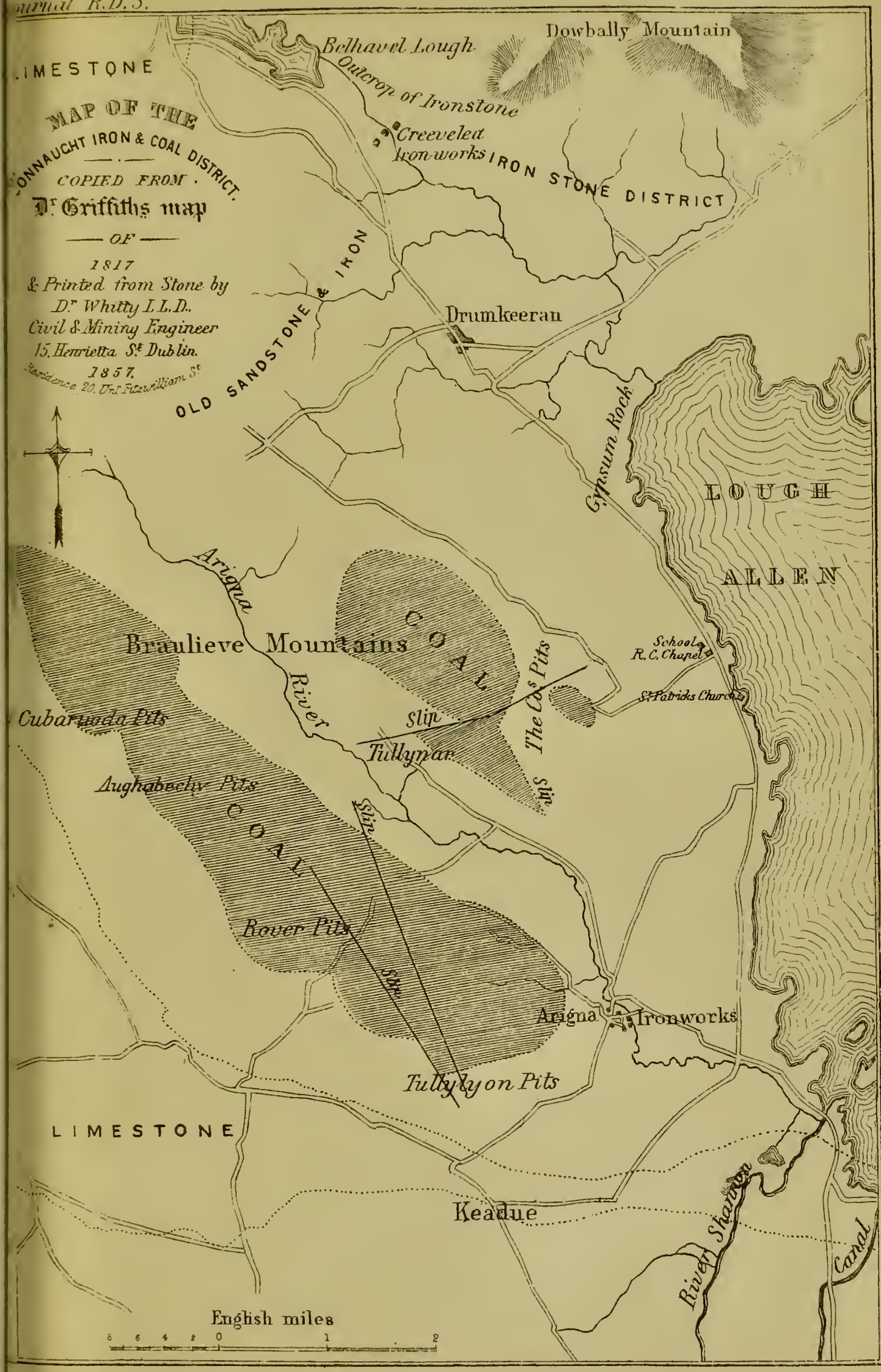
H — Carboniferous Slate, or Lower Limestone Shale. Cb — Arenaceous Limestone. Ga — Yellow Sandstone and shale. F — Old Red Sandstone, shale and conglomerate. B — Quartzite alternating with Mica Slate.

Section across the Hill of Kiltorcan in the County of Kilkenny, Shewing the position of the Plant Beds of the Yellow Sandstone, as they occur in the South of Ireland.



I — Lower Limestone.
G — Yellow Sandstone flag, alternating with fine Greenish shale.
F — Old Red Sandstone, shale and conglomerate.
E — Silurian strata.

Horizontal Scale, Four Miles to an Inch.
Vertical Scale, One Mile to an Inch.


LIMESTONE
MAP OF THE
CONNAUGHT IRON & COAL DISTRICT.
COPIED FROM
Dr Griffiths map
OF
1817
& Printed from Stone by
Dr Whitty L.L.D.
Civil & Mining Engineer
15. Henrietta St Dublin.
1857.
Residence 20. Uns Fitzwilliam St
Belhavel Lough
Outcrop of Ironstone
Creevelea Iron-works
Dowbally Mountain
IRON STONE DISTRICT
OLD SANDSTONE & IRON
Drumkeeran
Gypsum Rock
LOUGH
ALLEN
Arigna River
Braulieve Mountains
COAL
School
R.C. Chapel
St Patricks Church
The Co's Pits
Slip
Tullynan
Cubarwoda Pits
Aughabeehy Pits
COAL
Slip
Rower Pits
Slip
Arigna Ironworks
Tullykyon Pits
LIMESTONE
Keadue
River Shannon
Canal
English miles
8 6 4 2 0 1 2